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MARCH 17
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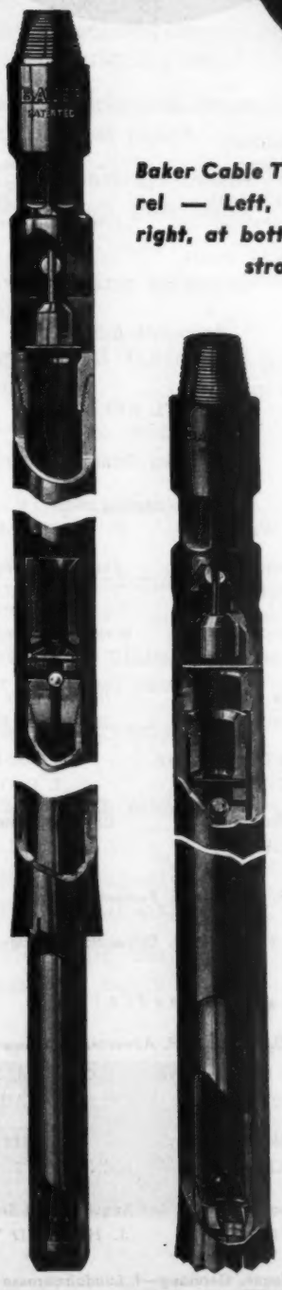

Baker Cable Tool Core Barrel — Left, at upstroke; right, at bottom of downstroke.

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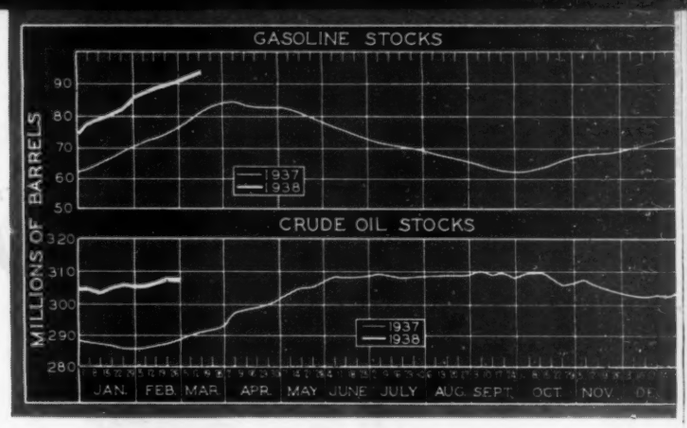


Stocks of Fuel Become Factor

REFINERS in all of the 10 refining areas in the United States are nearing the close of the principal fuel-consuming season with more stocks on hand than they had a year ago. In many cases their inventories are larger than they were at the start of the season last fall. Latest weekly reports show that the stocks of these heavier oils which include gas oils, distillates and residual fuels, are more than 23,000,000 barrels or 22 per cent, greater than they were a year ago. The quantity gain in this stock has been approximately 100 per cent greater than in the case of gasoline, on which the attention of the industry has been centered.

CRUDE PRODUCTION *3,380,201 barrels daily average—up 27,074 barrels.*

CRUDE STOCKS *305,167,000 barrels as of February 26—down 52,000 barrels.*

GASOLINE STOCKS *93,084,000 barrels as of March 12—up 933,000 barrels.*

REFINERY RUNS *3,100,000 barrels daily week ending March 12—down 30,000.*

It is no secret that among some of the larger refiners there is more concern regarding these heavy oils than there is about motor fuel inventories. The main gasoline-consuming period is just getting under way while in the case of the fuel oils, the refinery owners are faced with a reduced demand over a period of several months unless there is a reversal in general business trends.

The decline in demand for residual fuel oils, which for the country as a whole constitute 27 per cent of a barrel of crude oil, is entirely a reflection of general business conditions which have reduced all the principal outlets—marine, industrial, railroads and power plants. Cases are cited in which the industrial demand dropped off 50 to 75 per cent starting in November, with no substantial recovery since that time.

The situation is particularly unwieldy in California, where the stocks of the heavier oils are approximately 13,000,000 barrels higher than a year ago. The situation on the West Coast has developed over a period of several weeks, due both to an increased supply and reduced shipments to foreign buyers with reductions in domestic shipments.

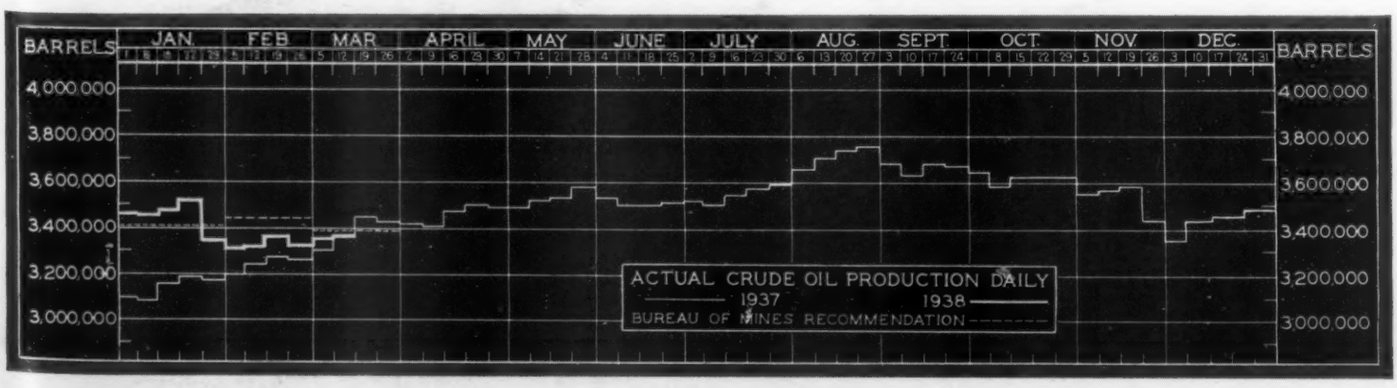
A reduced supply of these oils over the next several months is the only solution to this problem. Otherwise, there are certain to be price reductions to stimulate demand in markets where oil competes with other fuels. Lower prices if they materialize will also tend to stimulate cracking operations.

There were no important changes in the crude situation during the week. Most states are still above the recommended allowables and more proration by pipe line companies may be announced before the end of the month. In California there is some question as to whether the operators will be able to cope with the overproduction situation through voluntary cooperation, and support for a state conservation act is spreading.

Daily Average Production for Week

	Mar. 12 1938	Bur. Mines Mar. est.	Mar. state allowables	Mar. 5 1938
Oklahoma City	129,150	.....	.....	124,075
Fitts	59,100	.....	.....	62,475
Remainder of state	338,225	.....	.....	335,925
Total	526,475	547,700	475,000	522,475
East Texas	427,750	.....	.....	426,500
West Texas	186,497	.....	.....	180,950
North Central Texas	94,598	.....	.....	91,497
Texas Panhandle	58,000	.....	.....	67,298
East Central Texas	97,800	.....	.....	90,548
Gulf Coast Texas	321,506	.....	.....	313,200
Southwest Texas	104,348	.....	.....	99,750
Total Texas	1,290,499	1,344,900	1,300,506	1,269,743
North Louisiana	78,790	.....	.....	80,015
Gulf Coast Louisiana	177,000	.....	.....	176,748
Total Louisiana	255,790	239,400	246,755	256,763
California	725,250	694,600	694,600	727,500
Kansas	173,100	176,700	169,528	166,875
Arkansas	48,930	38,200	.....	49,770
Eastern fields	139,500	129,200	.....	139,900
Michigan	53,477	51,600	.....	50,191
New Mexico	105,090	105,100	105,100	105,110
Rocky Mountain area	62,090	64,200	.....	64,800
Total United States	3,380,201	3,391,600	.....	3,353,127

Increase, 27,074 bbls. daily.



Underground Oil Through Use of

By L. G. E. BIGNELL

This country has been developed by a series of pioneering movements which discovered vast natural resources. After the easily found reserves of raw materials were exploited the tendency has been to assume no more frontiers remain to be explored. True, if the surface only is considered, but the oil industry, which has been developed by the pioneering efforts of the "wildcatter" and later by well organized companies, still has great unexplored underground areas where modern science assures there are still large oil reserves to be found.

The geologist, geophysicist, paleontologist, mineralogist and other groups of technically trained men and women make up the modern pioneers of the oil industry. As old, easily found frontiers of the oil provinces are developed it is the duty of this army of scientists to discover new oil reserves. New methods of exploration have to be devised and more detailed application of all phases of the geological science applied to interpretation of data in order that these hidden pools of petroleum be located and developed.

Many fields were discovered by chance and others by applied geology. Those discovered by the wildcatter without aid of geology have since been studied by the geologist to determine wherein he failed in his interpretation of surface and subsurface data. Statistics show these pools found by chance have produced vast quantities of oil and many of them are of major importance to the industry.

This study of known oil fields has developed that there are now ways by which they might have been predicted in advance of drilling. Nature very cleverly hid those vast supplies of petroleum so that geophysics alone cannot outline the traps and indicate where the test holes should be drilled. However, it is now known that by adding the data secured by the drilling of exploratory test holes to the technique of geology it is possible to trace the position of major geological features and in this manner locate the probable hidden reserves.

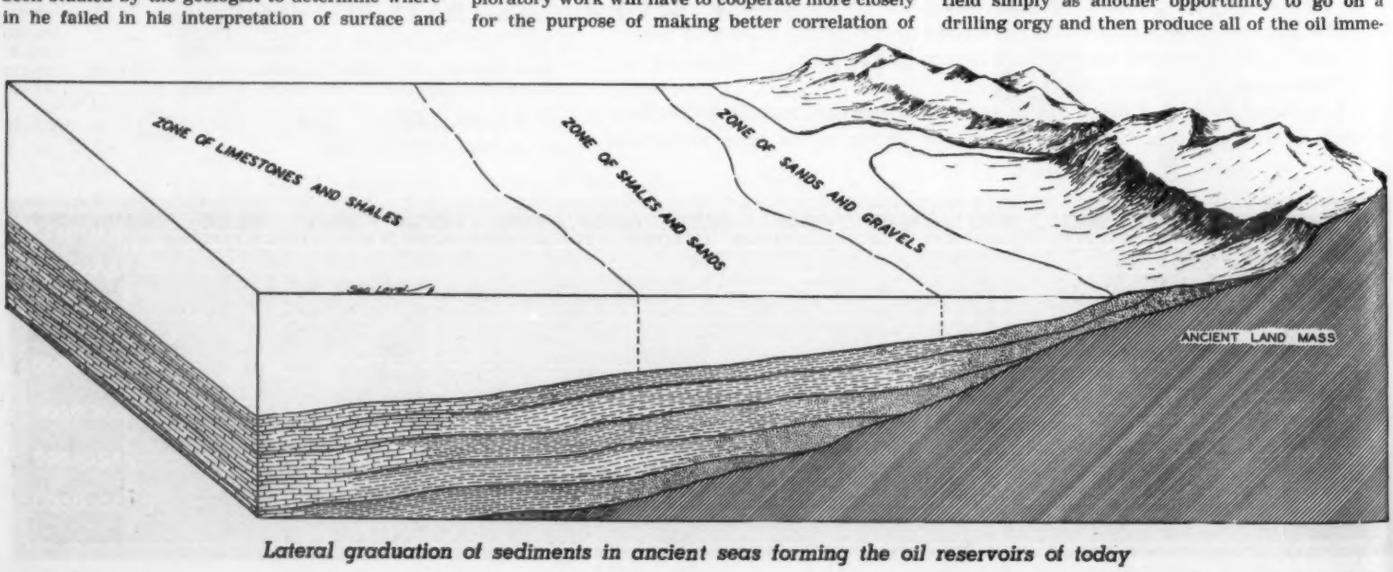
This type of search has been successfully applied in recent months and in West Texas one new pool has been opened which gives promise of becoming an oil field of major importance. The drilling of the so-called "slim holes" for the purpose of securing data on the stratigraphy and sedimentation of the area is less costly than prospecting the area with regular holes put down for the expressed purpose of finding gas or oil. In his paper (see page 41 of this issue) presented before the New Orleans meeting of the American Association of Petroleum Geologists this week Dr. F. H. Lahee, of Sun Oil Co., points out that in the southern states alone the industry could have saved more than $17,000,000 last year if the so-called "wildcat wells" had all been drilled by the "slim hole" method rather than by drilling most of them with regular heavy rotary rigs. In other words, twice as many test wells might have been drilled for the same money and the discoveries increased proportionately.

To carry on future work of this character the geologist, geophysicist, paleontologist, mineralogist and others engaged in different phases of exploratory work will have to cooperate more closely for the purpose of making better correlation of the data secured by the drilling of exploratory holes. General geology must first be applied to regional conditions. After developing as many facts as possible about the old land surfaces, now buried under thousands of feet of younger sediments, the next step is to interpret these facts into terms of sedimentation and deposition of source bed materials and the location of traps or reservoir space in which gas and oil could accumulate.

When all the evidence has been studied it is then up to the industry to provide the money needed to drill additional exploratory test holes attempting to locate the oil in stratigraphic traps and hidden pools. In this way the nation and the industry will be assured of an adequate future supply of crude oil to permit this industry to go forward with all the other industries which are going to expand and have need for more and more of the products of petroleum.

The mere act of finding a new reserve of oil does not imply that it is necessary to immediately reduce it to possession by bringing it to the surface to store in tanks or run through stills. Estimates made available, since January 1, this year, indicate the present reserves of petroleum in this country will suffice for about 11.2 years at the present rate of consumption. If all industry moves forward, as it must, then the supply will not last 11 years. With more than 29,000,000 automobiles powered by petroleum products and many of those cars having a prospective life of possibly 10 years the present supply of oil, if it could be made available, is only just enough to provide for the visible demand at this time, but it is not possible by the application of now known production methods to recover this present reserve of oil in 11 years.

Other industries have infinitely more raw material to draw upon for future needs than the oil industry has and in this age of the machine the products of petroleum are essential. If the oil industry continues to view the finding of a new oil field simply as another opportunity to go on a drilling orgy and then produce all of the oil imme-



Lateral graduation of sediments in ancient seas forming the oil reservoirs of today

Frontiers Can Be Extended New Exploration Methods

diately, the building up of actual reserves will be long delayed.

The geologist of the future will have a definite place in the executive counsel of the oil companies and in the industry generally. His viewpoint on many vital matters will be sought and he will have to play an ever-increasingly important role. Many of these duties were clearly outlined in the presidential address of H. B. Fuqua, at the A.A.P.G annual meeting in New Orleans. Points made by President Fuqua (see page 40, this issue) follow:

Cooperation refers, not to the contacts which normally exist between the departments, but to the numerous minor details of a technical or semitechnical nature which daily harass the busy executive and which. in the nature of his routine, he is unable to properly digest. More or less scientific articles in trade journals, perhaps covering in minute detail some subject in which he may have only a cursory interest, are noted by him or called to his attention. Time will not permit his studying the matter in detail, but he would in all probability welcome a one-page digest of the salient points of the article. Innumerable matters of a geological nature can be called to his attention either by memorandum or in conference. These and many other matters of a similar nature, properly discussed, may lead to executive appreciation and to a receptive attitude toward increased personnel to maintain and improve the type of service rendered.

Of all the fields open to cooperative efforts by the petroleum geologist, the drilling of wells and the production of oil—that phase of the corporate body usually referred to as the production department—is, in all probability, most seriously neglected. Here the personnel is, by training and experience, capable of handling the mechanical, practical and economic details of drilling wells and of producing the oil or gas. It is not to their discredit to state that they are not entirely qualified to interpret geological structure, to forecast and to recognize gas-oil and oil-water contacts, and to appreciate and understand the significance of the microscopic details of well cuttings and cores. It is to their discredit only when they fail to recognize the need of, or to accept the cooperation of the trained geological personnel available to assist them. When cooperation has been or can be established, the following recommendations and suggestions are among the many which should be made from time to time:

The proper casing procedure to employ in order to protect potential shallow water supplies for commercial and domestic use.

The proper casing procedure to insure against gas blowouts with their consequent hazard, expense, and physical waste.

The proper seating of the oil string in order to exclude all upper waters and any free gas which may be present above the oil pay.

The proper cementing procedure to protect upper pays when the well is completed in a multiple sand oil field.

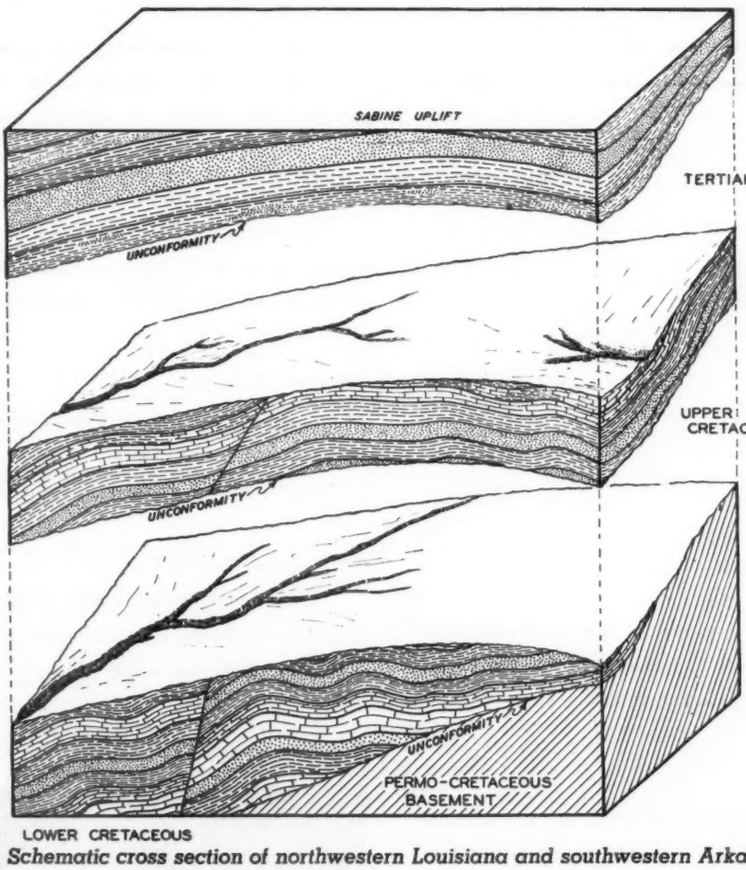
The analysis of waters in order to determine their source and suggestions as to their possible elimination.

The interpretation of Schlumberger surveys in the light of geological knowledge.

The depth to which wells may be drilled in order to penetrate a maximum of the pay section with minimum danger of encountering water. This subject requires much study of the field or area as a whole by men trained to understand and interpret structure and stratigraphy.

Scientific determination of and recommendations as to the method of artificial stimulation best adapted to wells where such procedure is necessary. Shooting with nitroglycerin, while expensive, is generally accepted as being the most efficient. In the case of limestone and dolomite pays treatment with hydrochloric acid usually produces excellent results per dollar invested. However, there are cases on record where such treatment has actually damaged rather than increased the productive capacity of wells, due, in all probability, to the amount of insoluble materials present in the host rock, which, when driven back into the formation under pressure, tend to clog the pore space. It is the function of the geologist through a study of samples or cores, to protect the operator against such occurrences. Frequently in late stages of recovery, excellent results are obtained by water-flooding or by gas or air injection and, again, the geologist with a detailed knowledge of conditions within the pay zone can be of material assistance in working out the proper program.

A detailed study of old producing wells or fields before abandonment. Obviously no well should be abandoned until the geological department has had an opportunity to determine the advisability of drilling to deeper pays or of testing any shallower pays.



Schematic cross section of northwestern Louisiana and southwestern Arkansas

For other important contributions and abstracts in connection with the A.A.P.G. and S.E.G. meetings at New Orleans, see the Special Section starting on page 40 of this issue.

SPARKS FROM THE NEWS

RECESSION TRENDS

Motor fuels are more recession proof than burning fuels. Latest government reports show gasoline consumption running ahead of last year with a decline in fuel oil demand.

HOWLING AGAIN

After a temporary lull, the wildcats are beginning to howl in Kansas again. New pools were opened in Stafford and Woodson counties, and several areas in other counties were extended the past week.

THE REASON

There are now more than 600 active fields in Texas. This explains why the state's crude production is double that of any other state.

INEXORABLE

Confiding car owners in Wyoming must not stop at telling the station attendant to "fill her up". They have been notified to satisfy themselves the state tax of 4 cents has been paid, for they will be held liable for it.

FEW JOBLESS

Refinery workers are doing far better than most employes of other industries. Employment in January of this year was only .6 per cent below that in January, 1937.

FOREIGN DEMAND

Exports of crude oil and refinery products are expected to total 170,000,000 barrels in 1938—a market outlet more than enough to absorb the entire crude output of Louisiana and Kansas this year.

PLAYING SAFE

Mississippi is playing safe. It is enacting a conservation act before oil is found in large quantities, thus avoiding a lot of useless arguments.

SMALL PERCENTAGE

Only 1.4 per cent of Pennsylvania's area has been productive of oil, or less than 432,000 acres. About three times the size of the East Texas pool!

PLAYING BOTH ENDS

An economist opines "you can't beat the oil business." When temperatures are unseasonably high, home owners consume less furnace oil, but more gasoline. Vice versa when temperatures are low.

PIPE LINE BOOST

Heavy gasoline buying is expected before higher freight rates become effective March 28. Incidentally the higher rail tariffs will increase the attractiveness of gasoline lines.

DOODLEBUGS SLIPPING

Survey shows wildcat operations recommended by geologists three times as successful as those made by others. The doodlebug experts are slipping fast.

NEW FROM OLD

Blue Lake in Sabine Parish is the latest old shallow area to join the gusher class. A deep sand discovery shows an initial production of 10,000 barrels daily.

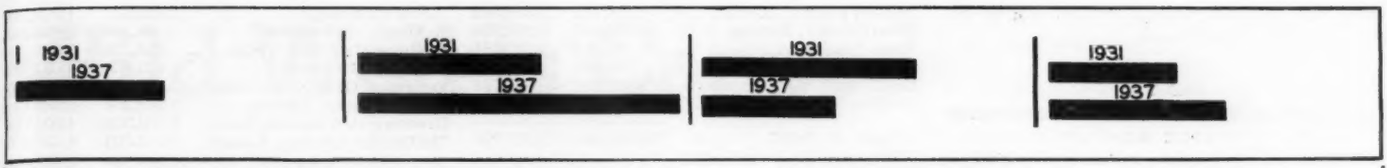
OPENS VAST AREA

They have drilled many producing wells in the waters of South Louisiana, but production did not extend into the Gulf of Mexico until last week with a wildcat completion.

THREE GALLONS A DAY

Martin-Decker Corp. Photo

Burmese women at Yenangyaung bail 95 per cent water to get 3 to 5 gallons of oil from dug wells



Groups 1 and 2—45 fields *Group 3—30 fields* *Group 4—31 fields* *All other fields*

Ups and Downs of Crude Oil Production in Six Years (1931 and 1937)

	PRODUCTION 1931 BBLS.	PRODUCTION 1937 BBLS.	INCREASE IN 1937 BBLS.	DECREASE IN 1937 BBLS.
Group 1 (twenty-two fields)	none	189,625,869	189,625,869	.....
Group 2 (twenty-three fields)	3,417,507	57,866,527	54,449,020	.....
Group 3 (thirty fields)	292,404,092	519,310,996	226,906,904	.....
Group 4 (thirty-one fields)	342,035,025	213,008,958	.....	129,026,068
All other fields	207,946,829	284,304,752	76,357,923	.....
Total all fields	845,803,454	1,264,117,102	547,339,716	129,026,068

Net increase in 1937 418,313,648 bbls.

Big Fields No Longer Allowed Rapid, Wasteful Depletion

By JAMES McINTYRE

In the six years from January 1, 1932, to January 1, 1938, the United States produced 5,933,535,515 bbls. of crude oil. Notwithstanding this enormous output the country has vastly more known oil reserves than it had at the beginning of 1932—at least 4,500,000,000 bbls. more.

This is a triumph of geological and geophysical science applied to the exploration for sources of oil, and engineering science and mechanical skill in deep drilling and in the handling of production, especially in the conservation of reservoir energy.

It will not be said of most of the fields opened in recent years, as it was said of the early-day fields, that only 20 per cent of the oil was recoverable by known production methods, and that 80 per cent was left in the underground reservoir. Modern production methods are lengthening the producing life of pools and making possible a greatly increased ultimate output.

When the Seminole pool was producing at its height in 1927 there were few oil men who would have ventured the guess that 10 years later it would produce close to 23,000,000 bbls. in a year, or that it would still be producing 55,000 bbls. a day after pouring out 629,500,000 bbls. in 12 years. But it was in Seminole that modern conservative methods of production were first practiced on a large scale, and it was results obtained in that field that led to even better ways and means of handling producing wells, thus getting the most out of them.

Accompanying this are a number of groups of fields the records of which show the effect of engineering skill, coupled with horse-sense, in producing oil. A total of 106 are listed. They comprise the most important fields in the United States. Only 31 of these pools showed a decrease in production between 1931 and 1937 and the decline amounted to an average of only 353,496 bbls. per day or 11,403 bbls. per day per field. These fields in 1931 produced an average of from 10,000 bbls. to 110,645 bbls. per day, an average of 31,236 bbls. per day per field. In six years they showed a net decline of only 36 per cent.

On the other hand 30 pools that were important as far back as 1931 increased their production 226,906,904 bbls. or an average of 621,663 bbls. per day, and an average of 20,772 bbls. per day per field. Both groups, 61 fields, showed a net increase in production of 97,880,836 bbls. in 1937 over 1931.

Then there were 22 major fields that had no existence in 1931, which in 1937 produced 189,625,869 bbls., or an average of 519,523 bbls. per day and 23,615 bbls. per day per field, which was all gain.

A fourth group, 23 fields, not in the major class in 1937, although most of them promise to reach that status this year, showed a gain in the six-year period of 54,449,020 bbls. or an average of 149,175 bbls. per day and 6,486 bbls. per day per field. All but a few of these were new fields.

But most interesting of all is the fact that all the other pools in the United States—thousands of them—showed a net increase of 76,357,923 bbls. or a daily average increase of 209,200 bbls.

Taken altogether the country after producing nearly 6,000,000,000 bbls. of oil, is still able to show an increase of 418,313,648 bbls. in annual production in the last year of the six-year period, an average gain of 1,146,065 bbls. per day.

Fields opened from 1859 up to say 1923 were developed so rapidly that they reached their peak of production very quickly and declined with great rapidity. Twenty-six of the leading pools discovered between 1900 and 1920 declined an average of 80.7 per cent three years after they reached their peak. Notable among these were Spindletop (Tex.), with 94 per cent decline; Humble (Tex.), 90 per cent; Burburnett (Tex.), 66 per cent; Desdemona (Tex.), 94 per cent; Mexia (Tex.), 82 per cent; Breckenridge (Tex.), 81 per cent; Haynesville (La.), 83 per cent; Glenn Pool (Okla.), 66 per cent; Cushing (Okla.), 81 per cent; Wortham (Tex.), 99 per cent; Santa Fe Springs (Calif.), 86 per cent and Powell (Tex.) 92 per cent.

Such declines are all deplorable features of the distant past. There still are a few spots where pools are permitted too much production for their own or their owners' good, but in Kansas, Oklahoma and Texas the industry has learned its lesson and is hoping that it can pass on the results to California and Louisiana.

The oil industry is better able to meet extraordinary demands upon it than at any time in its history. In the four years of the World War production in the United States averaged only 891,585 bbls. a day or about a quarter of its present actual output, and a much smaller fraction of the present potential production. In the two years the United States was engaged in the war production averaged 947,000 bbls. a day, or a quantity equal only to what was run to stills in 125 days in 1937. Production during the war was the full potential output of wells. It would have been insufficient for the needs of our government, the allied powers and the commercial market during the period, but the Mexican fields, then in their heyday, were called upon to their utmost and between the United States and Mexico there was enough oil.

Now we can produce four times as much crude oil and from it recover more than a correspondingly larger volume of products than we could 20

years ago, and do it without overdrawing on our known supply underground.

GROUP 1

PRODUCTION IN 1937 OF MAJOR FIELDS DISCOVERED SINCE 1931

	Production (bbls.) 1931	1937
Wilmington, California		14,181,162
Mountain View, California		6,835,954
Greta, Texas		4,683,044
Edmond, Oklahoma		5,884,427
Fitts, Oklahoma		30,976,949
Lucien, Oklahoma		5,046,528
Olympic, Oklahoma		4,315,466
Moore, Oklahoma		3,895,797
South Burbank, Oklahoma		5,579,341
Crescent, Oklahoma		3,851,687
Anahuac, Texas		4,352,378
Hastings, Texas		5,717,164
Plymouth, Texas		5,019,187
Tomoconnor, Texas		4,502,528
Talco, Texas		9,926,024
Conroe, Texas		15,157,548
Lafitte, Louisiana		4,105,393
New Iberia, Louisiana		5,932,212
Caillou Island, Louisiana		6,290,800
Gillis, Louisiana		5,083,156
Rodessa, Ark.-La.-Tex.		31,757,814
Buckeye, Michigan		6,531,310
Total increase		189,625,869

GROUP 2

PRODUCTION OF 24 MISCELLANEOUS FIELDS IN 1931 AND IN 1937

	Production (bbls.) 1931	1937
Cut Bank, Montana		3,346,205
Lisbon, Louisiana		2,377,724
Shuler, Arkansas		1,197,090
Black Bayou, Louisiana		1,323,883
Bosco, Louisiana		3,031,370
Cameron Meadows, La.		1,504,138
Hackberry, East, Louisiana		3,252,696
Jeanerette, Louisiana		2,220,641
Leesville, Louisiana		3,072,140
Roanoke, Louisiana		1,905,738
Sulphur, Louisiana		1,416,661
Tepetate, Louisiana		2,133,747
Wheeler County, Texas	118,663	3,881,537
Naval Reserve, Oklahoma		2,136,486
Nowata-Chelsea, Oklahoma	2,353,870	3,450,459
Dickinson, Texas		1,794,844
Amelia, Texas		1,486,607
Manville, Texas	77,255	3,458,697
South Houston, Texas		1,944,199
Tomball, Texas		3,034,048
El Segundo, California		3,642,486
Fruitvale, California	867,719	3,252,200
Illinois Basin, Illinois*		3,002,931
Total, 23 fields	3,417,507	57,866,527
Increase in 1937, 54,449,020 bbls.		

*The production in 1937 includes only that of the pools discovered last year.

GROUP 3

MAJOR FIELDS OF INCREASED PRODUCTION SINCE 1931

	Production (bbls.) 1931	1937
Kern River, California	3,847,474	5,555,639
Midway-Sunset, California	18,728,461	26,492,082
Coalinga, California	2,978,392	5,773,718
Coyote, California	3,751,857	4,276,075
Huntington Beach, Calif.	7,778,549	13,288,645
Inglewood, California	5,289,125	5,521,459
Dominguez, California	4,183,052	9,840,769
Kettleman Hills, California	16,544,824	29,131,362
Mount Poso, California	3,009,374	6,723,416
Lost Hills-Belridge, Calif.	2,983,749	7,756,984
East Texas, Texas	107,727,912	136,325,739
Ward County, Texas	1,203,540	12,376,290
Thompson, Texas	731,624	4,108,386
Hutchinson County, Texas	3,933,837	7,690,955
Laredo district, Texas	5,063,071	29,895,810
Archer County, Texas	4,384,656	4,634,806
Wichita County, Texas	6,644,987	6,144,840
Ector County, Texas	2,416,217	9,540,017
Young County, Texas	4,231,600	4,364,588
Upton-Crane counties, Tex.	7,102,015	10,847,364
Saxet, Texas	9,373	12,477,593
St. Louis-Pearson, Okla.	7,277,798	7,527,576
Oklahoma City, Oklahoma	44,833,508	54,776,210
Rice-Barton counties, Kans.	450,562	19,005,063
Russell County, Kansas	1,108,745	11,378,563
Reno County, Kansas	73,287	6,811,716
Iowa, Louisiana	17,312	6,235,381
Lance Creek, Wyoming	94,507	4,290,301
Lea County, New Mexico	14,596,684	36,097,764
Bradford-Allegany, Pa.-N.Y.	11,419,000	20,421,885
Total, 30 fields	292,404,092	519,310,996
Increase, 226,906,904 bbls.		

GROUP 4

MAJOR FIELDS OF DECREASED PRODUCTION SINCE 1931

	Production (bbls.) 1931	1937
Santa Fe Springs, California	24,272,660	15,749,710
Elwood-Goleta, California	10,470,059	3,206,333
Seal Beach, California	4,882,115	3,415,184
Elk Hills, California	4,925,636	3,785,942
Long Beach, California	30,166,409	21,870,310
Playa Del Rey, California	9,759,018	3,186,553
Ventura Avenue, California	16,255,256	12,688,649
Pecos County, Texas	27,401,174	12,619,943
Howard-Glasscock, Texas	9,762,304	8,379,845
Pampa, Texas	14,861,340	13,434,156
Wilbarger, Texas	4,167,464	3,434,156
Refugio, Texas	9,291,937	2,269,232
Winkler County, Texas	15,565,268	15,541,652
Barbers Hill, Texas	8,085,278	4,469,771
Sugarland, Texas	4,198,004	1,331,713
Big Lake, Texas	9,501,820	2,741,245
Van, Texas	15,542,023	11,479,825
Darst Creek, Texas	7,963,694	2,759,230
Bristow, Oklahoma	3,661,296	2,790,251
Seminole, Oklahoma	40,385,350	22,971,462
Sholem-Alechem, Tatums, Oklahoma	4,579,669	3,129,034
Allen, Oklahoma	3,839,577	1,973,134
Burbank, Oklahoma	4,566,290	3,653,768
Cushing-Shamrock, Okla.	4,656,393	3,908,408
Healdton, Oklahoma	4,025,058	3,653,768
Sedgwick County, Kansas	5,840,234	1,545,270
Butler County, Kansas	7,769,394	5,989,436
Greenwood-Woodson, Kans.	5,564,320	4,006,728
McPherson County, Kansas	9,184,393	4,450,978
Smackover, Arkansas	12,044,935	6,917,451
Salt Creek, Wyoming	8,846,658	5,952,821
Total 31 fields	342,035,026	213,008,958
Decrease in 1937, 129,026,068 bbls.		

Alberta Government Asks Tax On Oil and Gas Rights

EDMONTON, Alberta. — The Alberta government has introduced in the legislature a measure to impose a tax of 3 cents an acre on mineral rights, including oil and gas. Approximately half the mineral production of Alberta, largely oil, gas and coal, is secured from lands in which the mineral rights are held privately, including rights owned by Calgary & Edmonton Corp., Canadian Pacific Railway and Hudsons Bay Co. Homesteads taken up prior to 1887 also carried mineral rights, though after that date such rights were reserved by the federal government.

The present act is similar to one proposed in 1923 but disallowed by the federal government because the Dominion then held control of Alberta's natural resources. In 1930, however, these resources were transferred to Alberta jurisdiction. Provision is made for relief of the owner from the tax where the rights are surrendered to the province.

Californians Seek Quick Action by Legislature

By L. P. STOCKMAN

LOS ANGELES, Calif., Mar. 14.—After a year of stability during which producers and marketers enjoyed satisfactory earnings the California oil industry is plunging headlong toward another crisis and unless some constructive action is taken in the immediate future crude and refined oil prices will be drastically reduced in Pacific Coast territory.

A few months ago Standard Oil Co. cut the posted price of fuel oil 10 cents per barrel at San Francisco and Los Angeles and 15 cents per barrel at Bakersfield without making any revision in the posted price of crude oil to stimulate consumption of fuel oil and thus reduce the amount of heavy crude and refinery residuum that has been piling up at an alarming rate. Substantially more than 10,000,000 bbls. of crude and refined oils have been added to stocks during the past three months and with no relief in sight unless producers get down to business at once a drastic reduction in prices all down the line within 30 days may be expected. Operators in the Wilmington field hold the key to the situation and their action during the next 10 days will determine the future of curtailment. Operators in the Long Beach harbor section have reduced the maximum daily well production to 2,000 bbls. and threw the umpire's production allotment overboard. This action has created a condition of indifference and operators in other fields are not making any great attempt to keep production in line.

A voluntary committee of independent producers, consisting of A. D. Mitchell, chairman, Laurence C. Kelly and Lloyd Williamson, has stepped into the widening breach and will attempt to secure signatures to a petition to be presented to the legislature requesting remedial legislation. This bill which was recently sidetracked when a filibuster was undertaken by a few recalcitrants at a meeting of operators cannot correct the present situation because, even if enacted by the legislature, it cannot become effective until 90 days after signature by the governor. Even then it would be subject to referendum and thus would be delayed further. The legislature is at present working on legislation affecting the status of tidelands and the action taken may have a decided bearing on future production activities in the Long Beach and Wilmington harbor districts.

Representative of the pleas for speedy action on the bill was that of Cecil Rood, independent operator of Huntington Beach, who urged immediate passage of the measure. The 50 independent oil operators in that field were first to report offering unanimous approval of the proposed bill from all independents in the field acting as a unit. Other favorable reports followed rapidly.

Rush M. Blodget, executive vice president of the Oil Producers Agency of California, said a poll of the board of directors of the agency taken in a special meeting, March 11, resulted in a 25 to 1 vote in favor of the principle of state control of oil production.

The movement started about a fortnight ago to reduce California crude production at least 100,000 bbls. per day has failed to produce satisfactory results although a reduction of about 30,000 bbls. per day was affected. This reduction has since been offset by completion of several new large flowing wells in the Wilmington field where operators have approved the practice of flowing new wells wide open for seven days before cutting production back to 2,000 bbls. daily. No definite improvement can be expected until this situation has been overcome, especially since development work should result in completion of at least three new wells each week.

Members of the Central Committee of California Oil Producers have been working with operators in the Lake View section of the Midway-Sunset field to effect curtailment and have proposed a 10-day production holiday each month but developments indicate this field will decline to approve the recommendation until Wilmington operators conform with general provisions of the proration program. State production during the past few days has been averaging approximately 728,000 bbls. daily.

Wild Well Is Capped at Bottom of Crater

By NEIL WILLIAMS

HOUSTON, Tex., Mar. 14.—After blowing wild more than two months, F. Davenport and others No. 1-A Swallow, LaBlanca field, Hidalgo County, was capped the past week. With heavy, high-pressure christmastree connections securely in place, the well is safely under control although, pending setting of separators, it is being allowed to blow through the three 4-inch flow lines provided from the tree.

Located in the bottom of a large crater, more than 60 feet below the surface, the well presented unusual problems in capping. However, despite the difficult and extremely hazardous conditions, the actual job of placing the well under control was accomplished with a minimum of trouble, the work being done by crews of M. M. Kinley Co. of Houston.

The well got out of control early on January 9 when a spreading crater from an adjacent blowout engulfed it, causing the christmastree to break off and leave the well open. It had been completed in October and had been on production as a distillate well from a 7,900-foot horizon with pressure of more than 2,900 pounds on the tubing. Shortly after the christmastree collapsed, the gas in the crater ignited.

In the hole was a full string of 7-inch (O.D.) casing cemented on bottom at a total depth of 7,939 feet; 1,339 feet of 10¾-inch casing and approximately 150 feet of 16-inch surface pipe. For completion, the well was perforated through the 7-inch casing at 7,905-15 feet, and a string of 2½-inch tubing was run. For some reason the tubing was not blown out of the hole but where the top of the tubing now is, is not known. The well is producing both through and around the tubing.

From Junked Hole

The blowout which caused the crater occurred January 8 in a junked hole about 50 feet from the producing well. That hole had been drilled to 7,565 feet but with drill pipe stuck in the hole and efforts to sidetrack it unsuccessful the rig and derrick had been skidded to the new location where the producing well was completed.

Crews of M. M. Kinley Co. were called on the job about two weeks ago following failure of previous attempts to cap the well. At that time the gas flow of the original blowout in the crater had been killed as a result of the caving in of the wall of the crater at that point. This left only the flow of the producing well to be controlled.

Previously an attempt had been made to stab a heavy manifold with a swedge nipple on the bottom upon the top of the protruding 10-inch casing of the producing well. The manifold had been swung into place on the casing and clamped, but due to leaks which developed it had be to removed. In removing the manifold, it, as well as the equipment used in swinging it into place, fell into the bottom of the crater, and later had to be removed to permit final capping of the well.

To facilitate access to the well, an inclined trench roadway had been excavated from the surface back from the crater down to the floor of the crater. When the Kinley crews took over the job, the protruding casing, which had been bent over when the christmastree fell, had been partially straightened, leaving the pipe at an angle of about 30 degrees.

On taking over the well, the first task undertaken by the Kinley crews was to remove as much debris as possible. This included the first large manifold and the truck used in swinging it over the well. Then a large quantity of mud and water which had accumulated in the crater was cleaned out. A small pump was set up to keep the water seepage pumped out.

A problem, however, was faced in getting to the 7-inch flow string on the inside of the 10-inch casing. The 7-inch casing had dropped below the top of the 10-inch and it was necessary to get to it to fasten on the christmastree connections.

While plans were being made to cut off the protruding 10-inch pipe, a "break" occurred when this casing, due to constant swaying, broke itself at the base of the crater, and was blown off from around the 7-inch, leaving the latter protruding above the floor of the crater. Fortunately, no men were in the crater at the time. With the 10-inch pipe out of the way, the next step was to cut the 7-inch casing evenly at the desired height.

After this was done, the fire was shot out. Two shots were required, these being pulled over the well on a cable strung across the crater. The first shot, consisting of about 30 quarts of nitroglycerin, snuffed out the fire but the gas reignited shortly afterward, necessitating the second shot, which consisted of about 40 quarts.

In the meantime, a special christmastree for capping the well was assembled by Cameron Iron Works of Houston. This was made up with a three-way cross, using 4-inch outlets and valves, on bottom. On this was placed a spooled flange with hold-down clamps, and on top a 7-inch, 6,000-pound, pressured-operated, flange type, Cameron master valve with a 7-inch nipple and collar above. On the bottom of this assembly was placed a Kinley bradenhead, with lead seal, designed to fit down over the 7-inch casing.

(Continued on Page 32)

Ready to lower control head

Oil dock at Bush Terminals, Brooklyn, N. Y.

Petroleum Exports 170,000,000 Bbls.

By H. STANLEY NORMAN

NEW YORK, Mar. 14.—Producers and refiners in the United States can rely on the export market for disposal of approximately 170,000,000 to 175,000,000 bbls. of crude and products in 1938. Last year's exports totaled 172,813,000 bbls. The 1938 estimates reflect opinions among export departments of the largest shippers. Some export division heads anticipate a slight increase, while others think buying for military purposes abroad will taper off so exports will decline 1 to 3 per cent.

January figures favor the optimistic side with a sharp increase in crude shipments more than offsetting a slight decline in refined products. Preliminary figures issued by the Bureau of Foreign and Domestic Commerce place January, 1938, crude exports at 5,953,000 bbls., compared with 3,596,000 bbls. a year ago. Total exports of refined products in January is reported at 7,226,000 bbls., against 7,346,000 bbls. In the breakdown of refined products exported, it is significant to note that gasoline shipments in January totaled 2,578,000 bbls., against 2,978,000 bbls. a year ago, which included about 38,000 bbls. of benzol.

Military Purposes

The unknown quantity of petroleum purchases in 1938 by foreign powers for military consumption or storage makes estimating difficult. In at least two cases among the important exporters, however, contracts in hand for delivery through next December indicate their export business will be greater than last year by approximately 5 per cent.

Based on contracts in hand, the nature of inquiries for supplies later in the year and on results of January, it appears almost certain crude exports will climb to a new high, probably increasing as much as 10 or 15 per cent. Based on the export total of 67,868,000 bbls. of crude in 1937 this year's business abroad may climb to around 75,000,000 or 78,000,000 bbls.

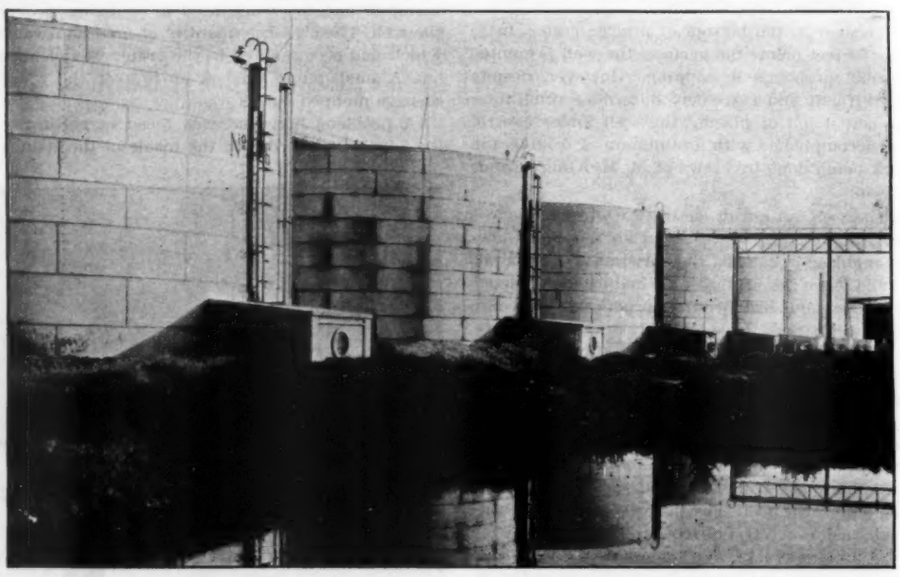
Anticipations of an increase in crude exports are based on the expected gain in foreign refining capacity, some of which became available during the latter part of 1937 and some of which is either in process of construction or definitely planned. Furthermore, some foreign refiners who operated below their maximum capacity are planning to increase their runs to stills to provide for expected increases in consumption.

In addition, there is a growing demand for selected types of crude from which lubricants and specialized products may be made. Such requirements abroad are reflected in a recent contrast between a French refining company and a producer in this country in which 4,500,000 bbls. of Saxet and East Texas crude is to be delivered during the year. This particular order does not represent new business in its entirety as the same buyer procured portions of his requirements from this country last year.

It is frequently impossible for sellers to trace definitely the ultimate consumer of purchases in this country because there are no reliable statistics available on foreign government purchases. The products may be routed through two or three hands before reaching destination and it is impossible to deduct from the known facts what quantities have gone into government storage or to determine how much military storage capacity remains to be filled and how rapidly the government will proceed to that goal.

It has been estimated, however, by V. R. Garfias, R. V. Whetsel, and J. W. Ristori of Cities Service Co., that 1937 consumption in the world for military purposes totaled 57,945,000 bbls., of which the United States consumed 10,459,000 bbls., leaving a balance of 47,486,000 bbls. for consumption abroad. The figures do not include an estimate of the volume stored for military purposes and therefore paint only half a picture of military requirements.

There are three elements in the petroleum export business. One is the supply from domestic companies to foreign marketing affiliates and sub-

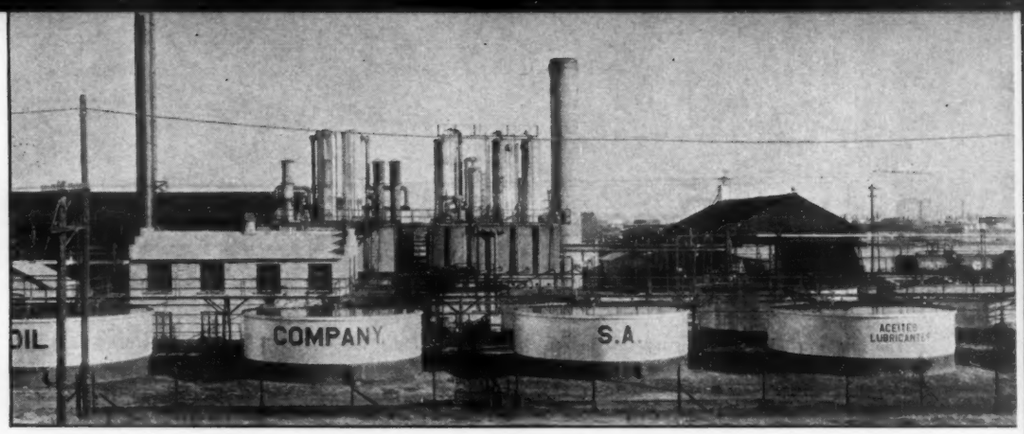


Oil storage at Constanza, Rumania

UNITED STATES PETROLEUM EXPORTS

	Crude oil		Motor fuel		Gas oil-distillate		Residual fuels		Lubricants		Kerosene	
	1937	1936	1937	1936	1937	1938	1937	1936	1937	1936	1937	1936
January	3,596,000	3,067,000	2,978,000	2,572,000	2,168,000	1,335,000	1,401,000	1,661,000	660,000	811,000	637,000	508,000
February	3,777,000	3,474,000	2,640,000	1,668,000	1,511,000	1,340,000	715,000	1,284,000	915,000	427,000	819,000	479,000
March	3,196,000	3,155,000	2,426,000	1,615,000	1,925,000	1,424,000	1,359,000	1,159,000	717,000	900,000	448,000	454,000
April	4,899,000	3,743,000	2,787,000	2,532,000	2,511,000	1,426,000	1,450,000	1,025,000	1,040,000	583,000	791,000	517,000
May	6,798,000	4,390,000	3,333,000	2,702,000	2,790,000	2,432,000	1,254,000	1,213,000	1,141,000	900,000	664,000	406,000
June	6,181,000	4,792,000	3,085,000	2,291,000	2,633,000	1,857,000	1,183,000	922,000	980,000	626,000	623,000	686,000
July	6,363,000	4,458,000	2,962,000	2,389,000	3,090,000	1,845,000	1,258,000	700,000	930,000	682,000	1,116,000	504,000
August	7,423,000	5,561,000	3,771,000	2,409,000	3,046,000	1,652,000	1,256,000	1,111,000	1,116,000	707,000	975,000	617,000
September	6,602,000	5,025,000	4,456,000	2,491,000	2,956,000	1,631,000	1,197,000	1,211,000	837,000	694,000	772,000	596,000
October	6,692,000	4,708,000	3,830,000	2,491,000	2,547,000	1,864,000	1,187,000	632,000	996,000	690,000	691,000	583,000
November	6,645,000	4,145,000	3,309,000	2,586,000	2,826,000	1,596,000	2,073,000	2,039,000	799,000	663,000	708,000	855,000
December	5,516,000	3,666,000	2,397,000	2,105,000	2,021,000	1,482,000	971,000	1,439,000	843,000	632,000	663,000	685,000
Total	67,686,000	50,184,000	37,974,000	27,831,000	30,024,000	19,884,000	15,304,000	14,396,000	10,974,000	8,315,000	8,907,000	6,890,000
Per cent increase over 1936	34.5		32.6		46.8		6.0		25.6		28.4	
Exports all refined products (1937)	105,127,000		(Totals revised. Some revisions not shown in monthly reports)									
Exports all refined products (1936)	81,681,000											

Estimated This Year



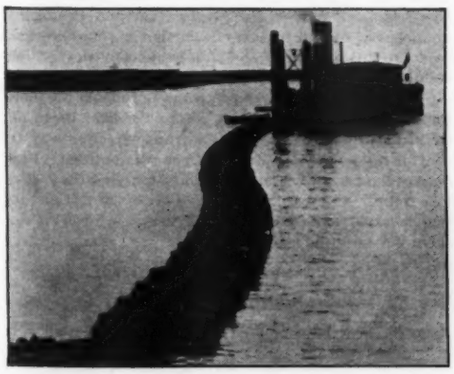
Section of Pierce Oil Co. refinery, Tamaulipas, Mexico

sidiaries. Another is the foreign contract customer who anticipates requirements and arranges for a supply with seasonal fluctuations. The third element is the spot buyer, usually represented in this country either directly or with close personal ties to a source of dependable supply.

Fluctuations within the first two elements are relatively slight and can be estimated with reasonable accuracy for 12 to 24 months in advance. The spot market, however, is more or less unpredictable. Spot buyers function in a spasmodic fashion, particularly since last December when the Gulf Coast export market started to drift lower. There has been relatively little activity in the spot market since the middle of January when several cargoes were purchased for February and March loading. Since the mid-January business export buyers have remained aloof, but refiners expect lethargy for duration of the market drift. Contributing to the spasmodic nature of export buying on a declining market is the unwillingness of refiners to push material except that necessary to ease their individual positions.

British Imports

Some cause for a more optimistic view of the export business this year may be drawn from January imports by Great Britain. Imports of refined products by Great Britain in January totaled 6,900,000 bbls., an increase of 30 per cent over a year ago. Crude imports by Great Britain, however, declined 4.4 per cent to 1,395,000 bbls. The big increase was in motor fuel with imports for January totaling 3,461,300 bbls., compared to 2,102,000 bbls. The United States is the third



Loading line for oil-using steamers at Naples, Italy

ranking source of Great Britain's gasoline imports, but is comparatively insignificant compared to Netherland West Indies and Iran. However, the United States shipped 405,700 bbls. of motor fuel to Great Britain in January, against about 204,000 bbls. a year ago. During January, Great Britain imported 828,085 bbls. of refined products from the United States, compared to 454,000 bbls. Lubricating oil shipments to Great Britain from this country in January totaled about 202,000 bbls., compared to 126,600 bbls. The United States also supplied more than 100,000 bbls. of Great Britain's residual fuel oil requirements in January, whereas this country failed to participate in this business in the preceding year.

The nature of Great Britain's imports in January compared to a year ago indicates the stress placed currently and during the latter part of 1937 on military preparations. At least a portion of the motor fuel increase may be assigned to expansion of the United Kingdom's air, naval and land forces which involves more training operations.

Prospective Factors

Also figuring in the United States' prospective exports this year is the probability that the Sino-Japanese conflict will continue for at least several months. There is also the Spanish civil war, although cessation of hostilities there probably would necessitate almost as much petroleum for rehabilitation.

Still another angle worthy of consideration is availability of supplies from Mexico. Following the Mexican situation through to one possible conclusion might involve realignment of trade channels taken away from that country and distribution of normal business to others. If the oil companies are unable to reach a settlement with the labor syndicates and the government the final result may involve withdrawal of the concerns and the procurement of supplies for foreign trade from other countries.

One new field in Venezuela has reached the shipping stage; one in Colombia is likely to figure in world crude supplies before 1938 terminates, and still other proven reserves in the Near East and in the Dutch East Indies may be drawn upon more extensively if realignment of trade arteries is brought about by developments in Mexico. Approximately 25,000,000 bbls. of oil out of total production of 46,000,000 bbls. in Mexico were exported in 1937. Replacement of 25,000,000 bbls., or a portion thereof, in world trade would probably place a somewhat larger demand on practically all countries producing in excess of their internal requirements. In supporting their estimate that total petroleum exports will again increase slightly this year, the optimists concede the rate of gain will be considerably reduced in comparison to the advances in 1937 over 1936.

Preliminary 1937 figures from the Bureau of Mines show the United States exports totaled 172,813,000 bbls., against 131,994,000 bbls. in 1936. The total was divided into 67,686,000 bbls. of crude and 105,127,000 bbls. of products. The largest gain in exports of refined products was in shipments of gas oil and distillate fuel, which totaled 30,024,000 bbls. for 1937, compared to 20,448,000 bbls. in 1936, a gain last year of 46.8 per cent. Motor fuel exports were also up, totaling 37,974,000 bbls. for the year compared to 28,648,000 bbls., an increase of 32.6 per cent.

While the motor fuel and gas-oil shipments were up considerably in January, March and April over 1936, as shown in the accompanying table, it was not until middle of the year that full importance of the export market was reflected in last year's consumption. In fact, crude exports in May to November, inclusive, practically doubled the rate in the first quarter.

Government Buying

In the final analysis the status of European military petroleum stocks is largely a matter of opinion. There is evidence that some governments plan to continue through 1937 their petroleum purchases at or above the level in 1937. Two large companies which sell direct to foreign governments have contracts calling for deliveries at about the same rate this year as in 1937 and are inclined to accept this fact against opinions of others.

Photos by Publishers Photo Service, except Bush Terminal by Brown. Bros.

New Jersey Chamber Opposes State Gasoline Regulation

NEW YORK.—Opposition to a New Jersey assembly bill providing for state regulation of gasoline prices was voiced last week by a committee on legislation from the New Jersey chamber of commerce. The committee issued a bulletin saying "opposition to the principle of state fixation of retail prices is developing among local civic bodies generally throughout the state." The chamber fears the bill may open the way for attempts by the state to fix retail prices of other commodities.

The New Jersey retail gasoline prices remain in a high state of unrest. Premium gasoline was procurable last week at company and dealer outlets for 16½ to 17 cents, including state and federal taxes. Service station prices on regular and non-branded products ranged downward to 13.6 cents, including taxes. The area immediately across the Hudson River from New York where all Manhattan, Long Island and Connecticut traffic is "bottle-necked" illustrates the disturbed retail conditions.

Barrels of oil awaiting shipment at Richmond, Calif., refinery of Standard Oil Co.

Revised Program for A.P.I. Southwestern Division

The program for the spring meeting of the Southwestern district, Division of Production, American Petroleum Institute, at the Blackstone Hotel, Fort Worth, Tex., March 24-25, has been revised. At the Thursday morning session W. E. Shoeneck, Ohio Oil Co., Shreveport, La., will preside; associate chairmen: L. A. Ogden, Pure Oil Co., Fort Worth; H. M. Staggs, Atlantic Refining Co., Dallas.

An address of welcome will be delivered by Amon G. Carter, Fort Worth, with response by A. G. Levy, Crown Central Petroleum Corp., Houston, district chairman.

"Progress in Oil Industry Vocational Training in Texas" will be discussed by J. R. D. Eddy, Texas State Board for Vocational Education, Austin, and "Individual Training in Accident Prevention" by A. W. Breeland, Lone Star Gas Co., Dallas.

At the general session, 2 p.m., Thursday, A. G. Levy, Crown Central Petroleum Corp., Houston, will preside during the presentation of the following papers: "Administration of the Oil Industry in New Mexico," by H. M. Dow, lieutenant governor of New Mexico. "What the Oil Industry Means to the Southwest," by W. R. Boyd, Jr., executive vice president, American Petroleum Institute. "The Growth and Importance of Natural Gas in the Southwest," by John S. Ivy, vice president, Union Producing Co., Houston.

W. S. Morris, East Texas Engineering Association, Kilgore, will preside Friday morning; associate chairmen: C. E. Reistle, Jr., Humble Oil & Refining Co., Houston, and H. H. Hardison, Standard Oil Co. of Texas, Midland. "Well Treatment After Perforating," Bruce Barkis, Lane Wells Co., Los Angeles. "Pressure Production Relationship—East Texas Field," S. E. Buckley, Humble Oil & Refining Co., Houston. "Problems in Design of a Salt Water Gathering System," J. E. Bailey, Tide Water Associated Oil Co., Kilgore.

Friday afternoon E. A. Wahlstrom, Goldsmith Pool engineering committee, Midland, will preside; associate chairmen: C. G. Staley, Lea County proration office, Hobbs, N. M., and W. A. Alexander, Shell Petroleum Corp., Iowa, La. "The Permian Basin and Its Drilling and Production Problems," W. T. Doherty, Humble Oil & Refining Co., Midland. "Use of Drilling Time in Determining Completion Practices—Goldsmith Pool," Max David, Landreth Production Corp., Midland. "Marine Drilling on the Gulf Coast," I. W. Alcorn, Pure Oil Co., Houston.

Humble Company Challenges Authority of N.L.R.B.

HOUSTON, Tex.—Humble Oil & Refining Co. has attacked the jurisdiction of the National Labor Relations Board to hear charges of unfair labor practices filed against the oil company by the C.I.O. dominated oil workers' union.

In attacking the board's jurisdiction, Hines Baker, Humble attorney, maintained the Humble refining department does not deal in interstate commerce and is separate from the pipe line subsidiary units which operate in New Mexico and Louisiana and since the refined products change title when they leave the company's docks here and at Ingleside, Tex., the commerce is confined to Texas.

Plaintiffs in the case being heard before the National Labor Relations Board at Baytown, Tex., in which Humble Oil & Refining Co. is charged with violation of the Wagner labor act, rested their case March 14. Testimony for the defense will follow. Decision of J. C. Batten, trial examiner of the board, on motion of the defendants asking dismissal of the charges has been reserved pending hearing of Humble testimony. Humble attorneys contended the evidence did not support the allegations. The workers union alleged the company coerced and restrained the union from organizing the Baytown refinery for collective bargaining.

Socony-Vacuum Launches New Tanker Building Program

NEW YORK.—Socony-Vacuum Oil Co., Inc., has launched a tanker construction program calling for minimum of two tankers a year for 10 years for orderly replacement of its 42 vessels now in North Atlantic and intercoastal service. Two vessels, each having displacement of 16,250 tons, are now under construction at the Sparrows Point, Md., yards of Bethlehem Shipbuilding Corp. These two vessels, expected to have a top speed of 15 knots, are basically sister ships of Socony-Vacuum's new Mobiloil and Mobilgas except that they each have displacement of 1,000 tons greater than the earlier tankers.

Texas Commission Upheld In Plugging Order Case

AUSTIN, Tex.—The Third Court of Civil Appeals set aside a trial court's judgment ordering an East Texas well plugged, on the ground that subsequent developments might justify its operation. In the past the court has overruled such contentions.

The right to plug or continue a well is left with the railroad commission in this instance, as contended for by the commission. It has been the commission's position that it should have discretion in ordering wells plugged as changing conditions cannot be quickly rectified by a court which entered judgment ordering a well closed.

National Scouts Association Convention in Tulsa in May

The 1938 convention of the National Oil Scouts Association of America will be held in Tulsa May 12, 13, and 14, the last day being designated as "Oil Scouts Day" at the International Petroleum Exposition, which opens on that date.

Plans for the convention were discussed at a meeting of chief scouts, assistants and company executives in Tulsa last Friday. Lee A. Adams, zone agent in the Oklahoma City area for Sinclair Prairie Oil Co. and chairman of the directors of the national association, presided. L. D. Miesse, Seminole area scout for Phillips Petroleum Co., also represented the national group at the meeting as an officer of the Oklahoma division.

W. S. ARTHURS

W. S. Arthurs, chief scout for Skelly Oil Co., was appointed general convention chairman and authorized to name subordinate committee heads and members. The following committee heads were named:

Ralph C. Steinman, chief scout, Sinclair Prairie Oil Co., entertainment committee; Mrs. Ralph C. Steinman, women's entertainment committee; Theodore Shaw, assistant chief scout, Sinclair Prairie Oil Co., golf tournament committee; Robert Curran, chief scout, Carter Oil Co., orchestra and music committee; Henry Langspecht, former chief scout, Shell Petroleum Corp., finance committee; Clyde Beebe, chief scout, Shell Petroleum Corp., housing committee. Trade journal and newspaper representatives will have charge of publicity.

Fifth Big Well in Sliverville Sand, South of Bradford

BRADFORD, Pa., Mar. 14.—The fifth big well in the Sliverville sand south of Bradford is in, and flowed between 40 and 50 bbls. in one hour, after which it was shut in. It was drilled by the Niagara Corp., which opened the stray-sand pool. All five wells produced over 40 bbls. of oil the first hour and were then shut in.

A.P.I. Permian Basin Chapter Holds Sessions at Midland

MIDLAND, Tex., Mar. 14.—About 400 attended the spring meeting of the Permian Basin chapter of the A.P.I. in Midland, Tex., March 12. The afternoon session was devoted to four papers on technical subjects of special interest to West Texas and New Mexico engineers and operators.

In keeping with the A.P.I. work in vocational training for oil field workers, the first paper was on "Looking at Vocational Training for the Petroleum Production Industry," by J. E. Heston, Cities Service Oil Co., Hobbs, N. M. He explained the program, which is being carried on through the joint efforts of the A.P.I., the state, federal departments, and local school authorities. The success of these classes in Hobbs, Eunice and Jal, N. M., and Wink, Tex., is encouraging formation of others throughout the Permian Basin.

The guest speaker of the afternoon was Frank G. Arnold, president of the Nebraska Federation of County Taxpayers Leagues. The many questions asked by those present were indicative of the interest in tax matters.

Glenn Staley, director of proration in New Mexico, presented an interesting review on the "Evolution of the Technical Man in the Exploration and Producing Branches of the Oil Industry." Particular reference was made to the proper place and responsibilities of the technically trained men in an oil-producing organization.

Gas-oil ratios and their control are probably the most important operating problem before Permian Basin oil companies today. As one popular and effective way to control ratios, the concluding paper was entitled, "Formation Packers," by Rex E. Rader, Stanolind Oil & Gas Co., Hobbs, N. M. His paper dealt with the use of this type packer for reducing gas-oil ratios as well as an agent for shutting off water.

West Virginia Petroleum Association Meets April 15

Edwin F. Patrick, secretary of the West Virginia Petroleum Association, announces that the organization will hold its annual convention at the Daniel Boone Hotel in Charleston on April 15. He said between 250 and 300 representatives of the producing, refining and marketing branches would be present and that taxation and legislation affecting the petroleum industry and its customers would be discussed.

Three Dead From Explosion

J. A. Mjolsness of Bergen, Saskatchewan, injured in an explosion at Economy Oils, Ltd., refinery in South Turner Valley during a trial run, died in a Calgary hospital. Ezra S. Bowden, 56, president, and Louis Bowden, 30, secretary-treasurer, were fatally injured.

The OIL AND GAS JOURNAL

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Double Incentive

The oil industry will have to keep in mind that all of the barrel of crude is not made into gasoline, that 53 per cent is made into other products which are controlled by conditions entirely different from those that govern the demand for gasoline.

This is emphasized in this week's report of the Bureau of Mines covering the production of crude and refining operations during January which shows that the domestic demand for gasoline increased 4.4 per cent but that domestic shipments of light fuel oil were 15 per cent lower than in January a year ago and heavy residual fuels declined 11 per cent.

In other words, while more gasoline was consumed than in any January in the history of the industry the demand for all fuel oils, depending upon several factors, decreased 235,000 barrels daily compared with the same month in 1937.

Gasoline demand has continued to expand during periods of slowing up in general business but this has not been true of other products largely consumed as fuel. The business recession of the past several months has reduced the demand for fuel oil from the railroads, power plants, many industries and the marine outlets.

Consumers who have not been doing the business they were a year ago have not required as much fuel. In the case of the steel and allied industries in several areas the demand for residual fuel is more than 50 per cent below that of a year ago.

Then there is the fact that weather conditions influence the demand for some grades of fuel oil—the oil used for domestic heating, including that used in hospitals, apartments and other public buildings.

Temperatures have been higher generally over a large part of the country than they were during the same period a year ago and this has been reflected directly in lessened consumption of fuel during the winter.

While the number of units consuming furnace oils actually in operation was greater, the total consumption, according to the best available information, was little or no greater than last season.

The significance of these facts is obvious. There are two conclusions to be drawn.

In the first place more attention should be paid to petroleum demand other than for gasoline. In the long run a decline in the demand for the 42 per cent of the barrel of crude made into fuel is just as important as an over production in the 47.5 per cent which represents the average gasoline yield from a barrel of crude.

The industry needs to have studies made of its fuel outlets comparable to those made on gasoline demand. Such studies would make it possible to project requirements for what constitutes more than 50 per cent of the yield of many refineries.

Secondly, the decline in the demand for fuel oil and the addition of 23,000,000 barrels to storage during the past year disposes of the contention that it is necessary to maintain high crude runs to stills in face of gasoline overproduction in order to supply the fuel market.

The industry will end the season with stocks substantially higher than they were at the start of the main fuel consuming period. Obviously it would be foolhardy over the next several months to add to these already heavy inventories.

This means the industry has a double incentive to reduce its plant operations, not only to bring about a healthier situation in motor fuel but also to prevent a large excess accumulation of fuel oil. The flexibility of refinery operations will permit this adjustment, provided the probable requirements are calculated far enough in advance, as they can and ought to be.

Now Two Proved Crude Areas in Turner Valley

By VICTOR LAURISTON

CALGARY, Alberta, Mar. 12.—An important report just issued by Dr. G. S. Hume, of the Geological Survey of Ontario, contains results of a study of the recent crude development on the Turner Valley west flank.

Doctor Hume states that there are now two proved crude oil areas in Turner Valley. The first is in the north where Model Oils No. 1, LSD 8, section 22-20-3w5, has been producing crude for some time, having changed from naphtha to 44-gravity oil. Model No. 3, LSD 1, same section, is also a crude producer, and Royalite No. 29 Turner Basin, LSD 2, section 27 20-3w5, is now testing the same general area.

The other crude area is on the Turner Valley west flank. The most northerly producer is Sterling Pacific No. 3, LSD 13-14, section 33-18-2w5, and the most southerly producer Brown Oil Corp. No. 1, LSD 14, section 16-18-2w5. Drilling is in progress both north and south of these producers. The report adds:

The crude oil area is limited on the east side by the gas-naphtha content of the same reservoir rock. The limits to the north, south or west are at present unknown. Commoil No. 1, drilled on LSD 15, section 29-18-2w5, was finished at a depth of 7,475 feet and gave a large yield of 42.7 degrees A.P.I. oil. This, and Sunset No. 1, finished at the same depth, are the deepest producing crude oil wells yet completed.

On the lower parts of the flank of the structure the oil becomes progressively heavier, but to date no water has been found. Several wells are being drilled south of Brown No. 1 which is now the most southerly producing well, and undoubtedly the field may be expected to extend some distance farther south.

Discussing structural conditions revealed by recent drilling, the report says:

Turner Valley lies on the east edge of the foothills, a complicated structural belt 12 to 20 miles wide, lying in front of the mountains. East of the foothills on the plains the structures are for the most part simple folds with the strata dipping at low angles, but within the foothills, steep dips are the rule and the strata are broken by faults of large displacement. In deformation of this kind, overthrust masses have moved mostly from west to east and in moving have dragged against the underlying masses, causing much drag folding.

On the surface Turner Valley appears to be a relatively simple fold. On Sheep Creek, Belly River strata dip rather steeply to the northeast on the east flank, and similar strata dips steeply northwest on the west flank, the arrangement suggesting a simple anticlinal fold. Drilling, however, revealed a large fault underlying Turner Valley and emerging at a steep angle at the surface, east of the eastern Belly River ridge.

The subsurface structures on the east flank were also known from drilling to be drag-folded and probably the part overturned above and in close proximity to the fault. The eastern edge of the productive Palaeozoic limestone is sharply defined by this fault, and hence the prospective gas and oil area has been proved to be limited in this direction. Drilling showed that the fault under Turner Valley had a relatively low west inclination, and it was inferred that should this same degree of dip of the fault plane continue westward, the limestone might also be cut off on the west flank of the strata; if steeper than the fault, must necessarily be cut off by it at depth.

Drilling has now definitely proved, however, that this is not the case in the south end of the field, and the inference is that everywhere the low-angle fault under Turner Valley again turns steeply downwards under the central part of the structure and hence will not be encountered in drilling on the west flank. This conclusion is of great importance in that it is now believed the crude oil areas on the west flank will only be limited by the oil-water line, which presumably must occur farther down the west flank than any well so far drilled.

It is thought that the fault dies out southward between Highwood River and Pekisko Creek in section 33-17-2. Apparently also the fault steepens southward towards Highwood River. The subsurface trace of the fault may be farther west, and if so the steepening of the fault may be slight.

In addition to this major overthrust fault underlying Turner Valley there are a number of other faults within it. The Cardium sandstone between the Upper and Lower Alberta (Benton) shales is a more resistant member than the surrounding shales. On deformation it broke or faulted in many places, whereas the shales more readily yielded by crumpling. The Blairmore formation also is much more competent than the overlying Alberta shales or the underlying Kootenay and Fernie formations and hence under strain yielded by faulting. The result is that many faults of considerable displacement in Turner Valley do not cut the Palaeozoic limestone as was formerly supposed, although the limestone to some extent is also faulted.

Lying on the west flank of Turner Valley is a higher fault plane, commonly referred to as the Outwest fault sheet. From drilling of Okalta No. 6 well on LSD 3, section 30-18-2, close to Highwood River and the Outwest and other wells near Sheep River in 19-3, it is known that this fault sheet is underlain by a low-angle fault. On Highwood River the fault apparently emerges in the badly deformed zone of shales, coaly shales and sandstones in section 20-18-2. West of this the beds, including the whole section of Belly River strata, dip eastward at angles of 40 to 50 degrees. Apparently, however, at a very moderate depth these beds are truncated by the Outwest fault, below which the beds dipping westward on the west flank of the Turner Valley uplift occur.

The Outwest fault sheet, however, completely makes the character of the Turner Valley fault sheet underlying it, and hence information as to the precise nature of the subsurface structure of Turner Valley under the Outwest fault sheet will only become known as drilling is done.

In the vicinity of Highwood River no well other than Okalta No. 6 has penetrated through the Outwest fault sheet into the Turner Valley structure under it; Scottish Petroleums No. 1 well, in LSD 16, section 19-18-2, began drilling on it. Thus at present it is unknown to what distance and at what rate the strata on the west flank of Turner Valley dip westerly without interruption.

There is no doubt that these factors will largely determine the extent of the oil zone on the west flank and hence are of great importance, but until correlations of strata in three or more wells penetrating the Outwest fault plane are known, no precise data on the character of the fault and the inclination of the strata under it will be available.

Fire Fighter Floyd T. Kinley Killed by Falling Pipe

Floyd Tipton Kinley, 33, younger of the world famous gas and oil well fire fighting team of Kinley brothers, was killed by a heavy joint of drill pipe falling upon him while clearing away debris preparatory to capping a wild gas well near Goliad, Goliad County, in the Gulf Coast oil region. The accident happened at about 11 a.m. March 12 and Mr. Kinley died in a hospital in Victoria late the same afternoon.

Myron M. Kinley, the other member of the team, was with his brother when the accident happened. In moving some of the accumulated debris around the well the kelly or upper joint of rotary drill pipe was freed and the gas pressure blew it from the hole and it fell on Floyd Kinley crushing his back.

From a passport photo

FLOYD T. KINLEY

Floyd T. Kinley was born in Bakersfield, Calif., November 28, 1905, and for the past 17 years has followed the fire fighting and shooting business, having learned it from his father, K. T. Kinley, still a resident of California. The brothers moved to the Mid-Continent district several years ago and from headquarters in Tulsa, traveled, mostly by air, to wild wells in many parts of the world.

The technique of fire fighting and controlling wild wells developed by the Kinley brothers was unique and called for the clearing away of all debris around the well head before the fire was shot out with nitroglycerin or capped if it had not caught fire.

Floyd Kinley's body has been taken to Bakersfield, Calif., for burial beside that of his mother. In addition to his wife and two-month-old baby, he is survived by his brother, father and a sister.

Obituaries

M. L. POLK, 35, production superintendent of Windsow Oil Co., Houston, Tex., died at Converse last week.

BURT W. CURRIE, 59, Knapp Creek, N. Y., oil producer, died at his winter home in St. Petersburg, Fla., on March 7. He retired two years ago because of ill health.

RICHARD McLAUGHLIN, 85, died in Huntington, W. Va., on March 7. He was in the employ of National Transit Co. for 35 years until 1922. His home was in Bradford, Pa.

BERNARD J. HANRATTY, 93, of Emlenton, Pa., retired oil man, died in Tulsa, March 10. He was a native of Connecutville, Pa. At an early age he entered the oil business and operated over Pennsylvania and Indiana. He also was interested in the pipe line branch.

WILLIAM S. WELKER, 73, Rouseville, Pa., died last week. He was born in Crawford County, Pennsylvania. Moving to Venango County in 1890 he engaged as a rig builder on the old Steele farm in Cornplanter Township. Subsequently he became a drilling contractor and operator and for some years had been operating the old Rynd farm in Cornplanter Township.

Fuel Oil Tax and Alcohol Amendment Defeated

WASHINGTON, D. C., Mar. 14.—The house passed the revenue revision bill after voting down two amendments of great interest to the oil industry—a discriminatory tax on fuel oil and preferential tax treatment for alcohol motor fuel.

The fuel oil amendment was voted down, 25 to 145, after lengthy debate. The alcohol fuel amendment was rejected without a formal vote and without debate.

The amendment to impose a tax of 1 cent a gallon on fuel oil used for heating purposes was introduced by Representative J. Harold Flannery of Pennsylvania and supported by his colleague, Patrick J. Boland, and several other representatives from anthracite and bituminous coal producing districts. It was vigorously opposed by several members of the house from oil-producing districts, but by a greater number speaking on behalf of their consumer constituents. The opposition was so forceful it should put an end to all fuel oil tax proposals for some time, although supporters indicated they will try again in the future.

Opening the debate, Representative Flannery attempted to arouse sympathy for consumers by declaring the government is taxing gasoline, a necessity, and leaving untaxed fuel oil, a luxury.

Mr. Boland pointed out benefits to the coal industry which would come from the tax, declaring only 5 per cent of the money derived from production of oil goes to labor, whereas 65 per cent of the money derived from production of coal is given to labor. Others supporting the amendment were Representatives Robert G. Allen of Pennsylvania and Jennings Randolph of West Virginia. The frankest speech in support of the proposal was made by Representative Matthew A. Dunn, blind congressman from Pennsylvania, who said simply: "Mr. Chairman, I am in favor of this amendment because it means more work for the coal miners in my district. Amen."

Opponents of the amendment ridiculed the idea that oil is a luxury fuel, denounced the tax as a tariff between competing industries, and declared Pennsylvania congressmen have never shown any interest in measures looking toward genuine oil conservation. Representative John D. Dingell of Michigan said the proposal is not a tax matter or a revenue matter, but purely a question of coercion. "I am not willing to dictate to the people what kind of fuel they shall use. This is an iniquitous proposal and has no place in the house. If there had been any merit in the proposal the ways and means committee would have given it consideration and probably have included it in the revenue bill. It adds nothing to the bill but viciousness and favoritism and should be defeated."

Pointing out the proposal would impose a burden of $15,000,000 annually on citizens of New England states, Representative Allen T. Treadway of Massachusetts declared: "I do not think the outpouring of the expression of individual consumers and domestic householders can be called propaganda when it directly affects their pocketbooks and budgets. In the last five years I do not think I have received as many letters on any one subject from men and women owning their own homes as I have on the subject of the possibility of a tax on their fuel. It is not insidious propaganda in any sense. It is the outpouring of expression of oppressed taxpayers."

"This is not a conservation measure by any manner of means." declared Representative Wesley E. Disney of Oklahoma. "This is a proposal for a domestic tariff. Let us carry the principle to its logical conclusion. Let us tax cotton because it competes with wool, if we are going to tax oil because it competes with coal. Then, let us tax wool because it competes with cotton, and then let us tax both of them because they compete with each other. It is nonsense. Taxation to destroy competition is not sound public policy. This amendment does not go into the conservation of oil, even indirectly, and it is simply a competitive tax in favor of coal, to the detriment, not of the oil industry particularly, but to the detriment of the whole country."

Representative William R. Poage of Texas, when Representative Allen was talking about the number of coal miners who would benefit from the tax, asked: "Would not more labor be used if we chopped up wood to provide the fuel than would be used in digging coal?"

A highly satirical speech was made by Representative John O'Connor of New York, who declared: "Of course, the supporters of the new tax are not inspired by any ulterior motive, such as that they now represent districts containing mines of coal, the competitor of fuel oil. Why, no, perish the thought! Their whole purpose is founded on the highest patriotic and altruistic plane—conservation of our natural resources. Such unselfish statesmanship deserves the universal applause of every citizen who has a furnace or stokes one. Who would deprive him or her—usually her—of the ecstatic joy of getting up at 5 a.m. and going down to the cold, damp cellar, where the home brew used to ferment, raking out the cinders, behind smoked glasses, if any, shoveling on the coal, and wearing a sweater during breakfast, this operation to be performed several times a day, and then at night, just before going to bed, what domestic joy! The house is getting chilly. Then comes that last joyful trip, in pajamas, into the nicely cooled cellar to bank the fire. Nothing should more inspire love of country!"

Mr. O'Connor declared that of all modern inventions there is none to compare to the comfort offered by the oil burner. After the manner of H. G. Wells, he forecast a meeting of congress in the year 3938 to receive a report that oil resources are close to exhaustion and to be reminded that 2,000 years before Representatives Boland and Flannery predicted this would happen.

Several other congressmen denounced the tax in bitter terms, Representative Robert L. Bacon of New York describing it as "crackpot, ridicu-

lous, insane, stupid, rank, discriminatory, punitive, and hypocritical."

As a parting shot, Congressman Flannery said, "You may try to laugh this amendment down, but I predict those who vote against this amendment will rue the day they ever cast a vote to dissipate one of our natural resources. In view of the fact that our supply is limited it is nothing short of a crime to use it for space heating and steam generation. The oil people have lobbied around, spreading false propaganda poisoning the minds of the people, until I know the amendment has not a single chance. When the people really understand the situation, we are going to write this amendment or a similar amendment into our tax laws to preserve one of our essential natural resources."

Alcohol Amendment

The alcohol amendment, offered by Representative Vincent F. Harrington of Iowa, would have exempted from the 1-cent federal gasoline tax motor fuel mixed with 10 per cent or more of anhydrous ethyl alcohol produced from annual agricultural crops. Mr. Harrington described it as an attempt to foster an infant agricultural industry—the manufacture of fuel alcohol from surplus farm products—declaring its effect would be to remit to the farmers and consumers the 1-cent tax on gasoline blended with alcohol. There was no debate on the proposal, and the amendment was rejected by a voice vote.

Ruling on Depletion

In recent decisions the supreme court has ruled that the mineral depletion allowance of 27½ per cent permitted by the federal income tax laws should be strictly construed, and that the deduction may be taken only by a person or corporation actually owning oil or gas in place.

The principles governing the depletion allowance were discussed in considerable detail by Chief Justice Hughes in the Bankline Oil Co. case. The company operated a casinghead gasoline plant in Signal Hill oil field, Los Angeles, Calif., and had contracts with oil producers for treatment of wet gas. The company contended it was entitled to deduct for depletion 27½ per cent of the difference between the price it paid for the wet gas and its fair market value at the well. The government maintained that under contract the company took no part in the production of the wet gas, conducted no drilling operations, did not pump oil or gas from the wells, had no interest as lessor or lessee, or as sublessor or sublessee, in any of the producing wells.

The decision said the mineral deposits are wasting assets and the deduction is intended as compensation to the owner for the part used up in production.

"The percentage is of the gross income from the properties, a phrase which points only to the gross income from oil and gas. The allowance is to the recipients of this gross income by reason of their capital investment in the oil or gas in place. . . . It is plain that, apart from its contract with producers, respondent had no interest in the producing wells nor in the wet gas in place. Respondent is a processor. It is not engaged in production. . . . Undoubtedly, respondent through its contract obtained an economic advantage from the production of the gas, but that is not sufficient. The controlling fact is that respondent had no interest in the gas in place. Respondent had no capital investment in the mineral deposit which suffered depletion and is not entitled to the statutory allowance."

This principle was carried further in the case of Thomas A. O'Donnell, who owned one-third of the capital stock of San Gabriel Petroleum Co. He sold this stock to Petroleum Midway Co., Ltd., which agreed to pay him one-third of the net profits from the development of the oil and gas properties then owned by the San Gabriel company. O'Donnell attempted to deduct the depletion allowance from the payment made under this agreement, but this was denied by the supreme court, which said: "The question is whether respondent had an interest, that is, a capital investment, in the oil and gas in place. As a mere owner of shares in the San Gabriel company, respondent had no such interest. . . . The agreement to pay respondent one-third of the net profits derived from the development and operation of the properties was a personal covenant and did not purport to grant respondent an interest in the properties themselves. . . . The profits did not constitute a depletable interest in the oil and gas in place."

In the case of Elbe Oil Land Development Co., which owned oil and gas prospecting permits and leases and after the discovery of oil conveyed all its title and interest to Honolulu Consolidated Oil Co. for a cash payment plus a percentage of the net profits, the company attempted to deduct the depletion allowance from its gross income received as its share of the profits of the Honolulu company, but the supreme court ruled the depletion allowance could not be taken in such a situation, declaring, "The words 'gross income from the property,' mean a gross income received from the operation of the oil and gas wells by one who has the capital investment therein—not income from the sale of oil and gas properties themselves."

WILD WELL CAPPED

(Continued from Page 25)

The assembly, hung on a chain hoist, was pulled over the well on a cable strung across the crater. When over the well it was lowered by the chain hoist, and set down on top the of 7-inch casing, the special bradenhead fitting around the pipe. During this operation, the master gate on top of the assembly was left open. Around the bottom of the bradenhead is a row of setscrew bolts, which, after packing was pushed up around the 7-inch casing inside the bradenhead, were tightened securely.

When the blowout occurred, a rack of approximately 8,000 feet of 4-inch drill pipe, together with a kelly joint and other drilling equipment, fell into the crater and became buried in the soft mud bottom. Most of this never was removed, and as the ends of some sections of pipe remained protruding, they were used for tieing down the christmas-tree and holding it in place. With turnbuckles, cables were fastened to the tree and wrapped around all the pipe and heavy equipment in the bottom of the crater that could be found to tie to.

Mud and water which had accumulated in the bottom then was jetted out for several feet around, leaving a large hole, which was filled with cement. First, approximately 100 sacks of cement was pumped in between the 7-inch and 10-inch strings of pipe to seal them. For this, a section of 1-inch pipe was used as a hoze nozzle. Then, sufficient additional cement, totaling about 250 sacks, was poured in around the well to cover all the deadmen and the base of the well above the bradenhead connection.

Pending setting of the cement and connection of vent lines from each of the three 4-inch outlets and valves on the tree to the top of the crater, where they tie into a manifold to a 10-inch section of line provided for separator connections, the master gate on top of the assembly was kept open four days.

No trouble was experienced in closing the gate, which is operated from the surface several hundred feet from the well. The well is now blowing through the three 4-inch lines (one with 2½-inch choke). For the time being no attempt will be made to close it in, although so far separators have not been set up for handling the production. The well is being watched closely for leaks. So far none has shown up but should any appear the top master gate can be opened quickly to provide additional pressure relief. The latter valve has been opened for a time since first closed to determine its workability. In the final installation, all valves will be pressure-operated from controls at the surface.

Biggest January Demand for Gasoline on Record

Crude oil production continued to decline in January, when the daily average was 3,419,600 bbls., compared with 3,438,000 bbls. in December and 3,179,600 bbls. in January, 1937.

Production in East Texas increased slightly, but the output in most of the other important districts of the state declined so that the daily average output for Texas fell from 1,336,500 bbls. in December to 1,317,700 bbls. in January. Developments in the Wilmington field were responsible for another increase for California, from 705,000 bbls. daily in December to 709,900 bbls. in January. Oklahoma's production showed another small decline, the daily average being 561,600 bbls., compared with 569,500 bbls. in December. A decline was recorded in New Mexico, but Louisiana's output continued upward under the impetus of developments in the coastal fields. Another small increase was registered in Illinois, the daily average (36,400 bbls.) being the highest in about 20 years.

The relationship of supply to demand for crude petroleum in January was about the same as in December, the small decline in production being offset by one of about the same size in crude runs, and stocks again registering a gain of several hundred thousand barrels.

Refined Products: The domestic demand for motor fuel in January was 35,176,000 bbls., exports were 3,090,000 bbls. Compared with a year ago, these data indicate a gain in domestic demand of 4.4 per cent and in total demand of 4.3 per cent. Although these gains in demand appear material, they were smaller than generally expected as the demand for January, 1937, was thought to be abnormally low. The increase in gasoline stocks was accelerated, the total for finished and unfinished rising to 85,873,000 bbls., or 8,883,000 bbls. above the level of the previous month. According to the A.P.I., about 6,000,000 bbls. was added to these stocks in February.

Of primary interest in the January figures was the indicated decline in fuel oil consumption. The domestic demand for light fuels was 15 per cent below a year ago, heavy fuels 11 per cent lower. The domestic demand for the two classes combined was even lower than in January, 1936.

According to data of the Bureau of Labor Statistics, the price index for petroleum products in January, 1938, was 58.8, compared with 59.5 in December and 58.3 a year ago.

The refinery data of this report were compiled from schedules of refineries having an aggregate daily crude oil capacity of 4,027,000 bbls. These plants operated at 78 per cent of capacity, compared with a revised ratio of 79 per cent in December.

Freight Rate Advance to Bring Higher Prices for Gasoline

Since the tariffs under the new freight rate schedules have not yet been issued by the Interstate Commerce Commission, oil companies do not know definitely what their rates will be. Approximations have been made, however. In the case of the Group 3 refiner the present freight rate on gasoline out of that area to Chicago is 2.44 cents a gallon. The new rate, traffic managers conjecture, is likely to be 2.64 cents. Similarly calculated increases, they say, are: Milwaukee, Wis., 2.67 to 2.84 cents; Detroit, Mich., 3.14 to 3.37 cents; Des Moines, Iowa, 1.82 to 1.91 cents.

The general increase of 10 per cent in freight rates on all but a few commodities approved by the commission March 8 does not mean that all petroleum freight rates will be increased by this percentage because the commission ordered that this 10 per cent must include all general freight increases made during 1937. On October 25 the I.C.C. granted increased rates on petroleum and a number of other so-called basic commodities (Ex Parte 115), and the increases granted then must be made a part of the new 10 per cent increase. The increases granted in October on petroleum and petroleum products were generally 1 cent per 100 pounds except in southern territory, the states south of the Ohio and east of the Mississippi rivers. Therefore, wherever this 1-cent increase equals 10 per cent of the rate prior to last October, no new increases may be made on petroleum rates, and in all cases where the 1-cent increase went into effect it must be included as a part of the new increase.

In discussing the effect on the petroleum industry of the requested 15 per cent increase in all rates, the Interstate Commerce Commission made some interesting observations:

Commission's Opinion

"The present opposition to further increases comes from producers and jobbers — generally those who are not able to utilize their own or associated pipe lines or tanker vessels — and consumers in destination areas to reach which rail carriage is essential. Producers of petroleum products, principally gasoline, in the Mid-Continent area, Oklahoma, Kansas, and Texas, who are dependent solely on rail transportation for long hauls, oppose any increase in their rates. Much of their business into Chicago and other points has been lost to other producers who ship their gasoline by pipe line or by water. The protestants sell to independent jobbers, and compete with larger producers who use gasoline pipe line facilities in getting to competitive markets.

"Many factors other than freight rates determine or bear upon the marketing of gasoline, such as the cost of production, service, quality, national advertising of brands, availability of supplies in the consuming territory, and the efficiency of refinery operations. Transportation cost by rail, it is testified, govern the distribution of the product of the protestants to such an extent that if present rail rates are increased 15 per cent as proposed, a large portion of the shipment by rail will be eliminated, although protestants concede that such an increase would have no effect upon the retail price of gasoline. The price at which producers can deliver their product to jobbers is the most important factor governing their operation. It is mainly a question of relation between the rail transportation costs of the protestants and those of their competitors who have gasoline pipe lines or other available transportation facilities. . .

Proposed Pipe Lines

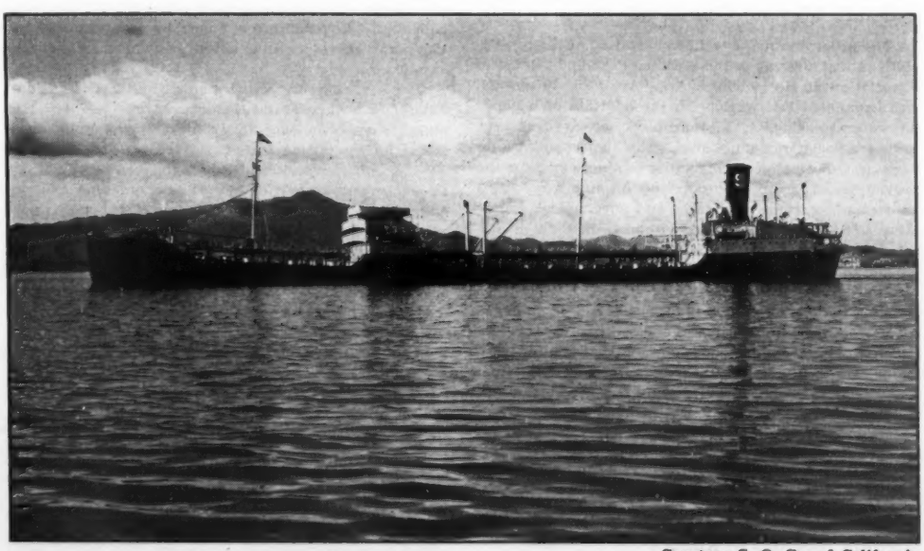
"Increases will force protestants seriously to consider building gasoline pipe lines to serve their refineries. Plans for two such lines have been discussed, one for a line to the Gulf Coast, and another for a line to Oklahoma, joining independent refiners in North Texas, Oklahoma, and Kansas, to interior Iowa distributing points, or possibly to Omaha, Minneapolis, Chicago, or Indianapolis. It is not clear that sufficient volume could be obtained to insure the success of these enterprises. A factor of considerable importance in marketing gasoline by rail from the Mid-Continent field has been the reduction of rail rates from pipe line terminal points in western trunk line territory to meet motor truck competition at those points. Such rates could not be increased to the normal basis so as to yield more revenue to the rail lines, unless the motor truck rates were also increased. Many of the reduced rail rates are intrastate, made to meet competition of intrastate motor truck carriers over whose rates we can exercise no authority. . . .

"The independent producer protestants express the opinion that if the rail carriers would apply the reasonable maximum rates prescribed by us they would secure more revenue than from the 15 per cent increase here proposed. The rate relation which would then be in effect would, in the opinion of these protestants, put all refiners upon a proper competitive relation. This suggestion, however, ignores the conditions which force reductions from the rail carriers in most of these instances, namely, a losing competition with other agencies of transportation. There is no reason to believe that any such amount of increased revenue as has been suggested would be attained if all competitive reduced rates were increased to the maximum reasonable basis. However, there is every reason the rail carriers should review with care the whole body of these competitive rates, to discover if the causes which lead to their being made have ceased to be controlling . . .

Independent Producers

"A large number of independent producers in the Mid-Continent field who depend upon rail service do not oppose increases in the rail rates, provided increased transportation costs are borne by all producing companies, including those who use other means of carriage than the rails. Our inability to control a situation where so much of the governing competition is not within our jurisdiction makes it impossible for us to accomplish such an equalization. In the final analysis, the chief difficulties faced by protestants arise from competitive producing and marketing conditions and only incidentally from the rail freight rate structure alone. And to a considerable extent the same difficulties prevent applicant rail cariers from obtaining the full benefit of rates which we have already approved as reasonable, but which in the exercise of the managerial discretion they do not endeavor to maintain as going rates."

The American Trucking Association has announced that the organization will publish soon a master tariff for all interstate common carriers by motor trucks increasing rates to substantially the same extent that rail rates are to be raised.



Courtesy S. O. Co. of California

Tanker W. H. Berg recently added to Standard of California fleet was named for new president and sponsored by Mrs. Berg

Refinery Expansion

The important items of testing equipment include: Ethyl demonstration engine, exhaust gas analyzers, cabinet with coil and condenser analyzers, manifold vacuum gauge, control tower with load meter showing power output and speed indicator and loading rheostat for dynamometer

Motor-Clinic Brings Oil and Automotive Engineers Together

A closer working relationship between the oil and automotive industries is the aim of the nationwide program of motor clinics being conducted by the Ethyl Gasoline Corp. These clinics are to be held in all major marketing points in the United States and these will attract oil marketing and automotive representatives from the surrounding territories. One of the clinics is now in progress in the Southwest, showing in Tulsa on its way to Gulf Coast and West Texas points.

The program is under the direction of John G. Martin and he expects to hold the clinics in at least 100 cities. Attending these shows will be at least 200,000 representatives of the oil and automotive industries. *(See issue February 10, page 51).* A typical "set-up" for testing a car is shown here.

Technical Program for Annual W.P.R.A. Meeting Completed

The program for the technical sessions at the twenty-sixth annual meeting of the Western Petroleum Refiners Association at Hot Springs, Ark., April 25, 26 and 27, was completed last week with the addition of a paper on water treating, A. V. Bourque, secretary-treasurer of the association, announced. The paper will be devoted to a discussion of correcting cooling water for the prevention of scale, corrosion and organic growths, a subject of extreme economic and mechanical importance to refiners. The author will be L. D. Betz, chemical engineer of Philadelphia, Pa.

The three papers previously announced for the technical program were True Vapor Phase, a process of cracking in the vapor state; the Howard Process, a method of treating gasoline, and the Pawhuska Road Tests which disclosed failure of the fuel systems of most motor cars to utilize the full value of refinery gasoline. The technical program will occupy the first afternoon and the second morning of the refiners meeting after which general sessions of the association, and election of officers and directors will be held.

Ark-La-Tex Refiners Hold Monthly Meeting at Kilgore

SHREVEPORT, La.—The regular monthly meeting of the Ark-La-Tex division of the Western Petroleum Refiners Association was held March 11, in Kilgore, Tex. S. C. Smith, chief chemist of Paluxy Asphalt Co. of Talco, Tex., was the principal speaker, delivering a paper on "Electrolytic Regenerative Process for Treating Cracked Gasoline Employing the Use of Sodium Plumbate." The paper included a discussion of the conversion of sodium plumbite to sodium plumbate, mixing the solution caustic washed raw gasoline and regenerating the partially spent plumbate solution in a cell box.

Texas Refiners Appeal for Credit on Insurance Rates

WICHITA FALLS, Tex.—A complaint and appeal has been filed with the Texas Fire Insurance Commission by the Committee of Oil Refiners in Texas, headed by Roy B. Jones, of Panhandle Refining Co., Wichita Falls. The appeal gives complete information of safety measures that are in effect in the operation of cracking plants and complete information as to past history of fire losses as compared with premiums collected. The committee hopes to secure for cracking plant operators substantial credits on existing insurance rates.

For several years refiners operating cracking plants have felt that the fire insurance rates on cracking plants have been excessively high, the announcement from the committee stated.

"Some six or seven years ago the Universal Oil Products Co., owner of the Dubbs cracking patents, acting in cooperation with its licensees, began to assemble accurate information on the experience of its licensees and these records reveal the following facts:

"That during the seven-year period ending January 1, 1936, insurance companies collected premiums from cracking plant operators amounting to $1,807,265, which represented an average rate of $1.37 per $100 of insured value.

"That during this same period losses were paid as a result of fire damage to cracking plants of $287,186, or a loss ratio of 15.89 per cent and this experience has continued up to the present date."

On July 14, 1937, a meeting was held by cracking plant operators in Fort Worth, Tex., at which time a committee was appointed to prepare a complaint. Mr. Jones was elected chairman of this committee, which included the following representatives of Texas refineries: W. D. Richardson, Cosden Oil Corp., Fort Worth; Ray Woolf, Shamrock Oil & Gas Corp., Amarillo; Ben P. Piepgrass, Solvex Refineries, Tulsa, Okla.; Capt. J. F. Lucey, Talco Asphalt & Refining Co., Mount Pleasant; R. E. Hall, McMurray Petroleum Corp., Tyler; J. D. Bright, Waggoner Refining Co., Vernon.

In the appeal the Texas refiners do not ask for any change in the present basic insurance rates; instead they ask that credits be given for a highly technical and efficient independent inspection service on cracking plants. This inspection service has been in effect continually and has been paid for by the operators of the plants, with a view to reducing the fire hazard and consequently they feel that credits should be allowed for this inspection service, which in reality is the only effective way of preventing explosions and resultant fires in cracking plants. While the committee is composed only of licensees operating under Dubbs patents, this credit for inspection service, it is believed, should extend to all cracking plants, regardless of the type, which maintain an efficient independent inspection service conforming to acceptable standards, as set out in the complaint and appeal.

New Brandon Refinery Acquired By Anglo-Canadian Company

BRANDON, Manitoba.—Anglo-Canadian Development & Holding Co. of Calgary has acquired controlling interest in Central Refiners, Ltd. which has a refining plant nearing completion here. The plant has an initial capacity of 1,000 bbls. a day, to be increased later to 3,500 bbls. It will provide an outlet for Turner Valley crude produced by companies sponsored by the Anglo-Canadian company.

Cities Service to Enlarge Capacity of Three Plants

NEW YORK.—Cities Service Oil Co. has announced plans for an expenditure of approximately $1,600,000 for expansion and modernization of refining facilities at Petty Island, N. J., East Braintree, Mass., and at East Chicago, Ind. Orders for about $1,000,000 in new equipment, it was said, had been placed with the Alco Products division of the American Locomotive Co., and work is due to begin immediately.

Chiefly involved is a 50 per cent expansion of refining capacity at the Petty Island plant. Work is already under way on the conversion of cracking units to combination units at this plant, at present having a crude capacity of 12,000 bbls. daily and a cracking capacity of 7,000 bbls. daily. Capacity of the East Chicago plant will be increased about 10 per cent. Also included is the construction of stabilization and propane recovery equipment at its East Braintree refinery.

Natural Gas

Two Carbon Black Plants Planned in Arkansas

SHREVEPORT, La.—Construction of two carbon black plants in Miller and Union counties, southern Arkansas, is reported under consideration. The plants will utilize gas from the Miller County section of the Rodessa field, and the fields of Union County, the principal gas producer of the latter being Shuler. A special session of the Arkansas legislature has been called to consider proposed laws permitting burning of natural gas for carbon black manufacture.

Texas Dry Gas Withdrawals Slightly Lower in January

AUSTIN, Tex.—Withdrawals of dry natural gas during January in Texas showed a slight decline as compared with December, 1937, according to the monthly report of the Railroad Commission of Texas. The state total for January was 2,032,754,000 feet daily as compared with 2,032,955,000 feet daily in December. The January, 1938, total, however, showed a great increase as compared with January, 1937, when 1,761,373,000 feet were withdrawn daily.

According to the report, 2,949 gas wells were pro-

ducing a total of 1,335,387,000 feet of sweet dry gas daily, and 697,367,000 feet of sour gas. Total casinghead gas produced daily amounted to 975,412,000 feet. The dry gas was disposed of as follows: To pipe line for fuel and light purposes, 27.8 per cent; to lease operation, 4.49 per cent; repressuring and gas-lift, 1.59 per cent; and to gasoline plant 66.12 per cent.

New York and Pennsylvania Gas Field Operations

COUDERSPORT, Pa. — Two wells were completed and two new locations announced in the New York-Pennsylvania Oriskany sand gas fields during the week. Empire Producing Co. completed its test on the Della Mulvey farm in Alma Township, Allegany County, New York, for an initial open flow of 18,500,000 feet. It topped the pay sand at 4,746 feet and was completed 10 feet in the sand. It had an initial rock pressure of 860 pounds. Ward Wasson completed a test on the R. B. Hall farm in Genesee Township, Potter County, Pennsylvania, for a total initial open flow of 5,500,000 feet after being shut down on top of the sand for several months. This well, tubed with 3-inch tubing, was completed at a total depth of 5,185 feet. Its initial rock pressure was 320 pounds.

The new locations are in Potter County. New Penn Development Co. has one on the James Hill farm in West Branch Township, and Hanley & Bird staked one on the Flora Brooks farm in Harrison Township.

With seven operations under way, the Woodhull field is leading all districts in activity. Deepest of those drilling in this field is New York State Natural Gas Co. test on the Lyle Wheatcraft farm which is down 2,365 feet.

Natural Gasoline

Absorption Plant Planned For the Rio Bravo Field

LOS ANGELES, Calif., Mar. 14.—With two wells already completed and five additional potential producers scheduled for completion within a few weeks by Union Oil Co., Superior Oil Co., General Petroleum Corp., and George F. Getty, preparations have been completed for construction of the Rio Bravo field's first absorption unit. This new natural gasoline plant which will have a daily capacity of 50,000,000 feet and cost approximately $500,000 will be erected jointly by Union Oil Co. and Superior Oil Co. on the former's Kern County land lease. Construction work will get under way within the next fortnight.

Natural Gasoline Association Revises Testing Methods

The Natural Gasoline Association of America recently revised its standard methods of sampling and testing for natural gasoline and has issued a new specifications card in which these revisions have been incorporated.

The revisions are in the nature of modernization rather than fundamental changes though one new standard was added, this being a method for sampling procedure and specification of definite requirements for sampling containers. The new standard is noted on the new specifications card as, "Same as A.P.I. Code 50-B." The latter was developed largely through cooperative efforts with the California Natural Gasoline Association, and the combined ideas correlated in committees of the American Petroleum Institute.

With reference to standard test methods, the association has done considerable work in recent years with these standards, revising and modernizing them to eliminate optional clauses and to otherwise improve technique to obtain more duplicable results. Through cooperation with the American Society for Testing Materials, these revisions have been incorporated in the corresponding methods of that society and the number references to these methods have been changed to the new designation of the revised A.S.T.M. standards. A slightly extended abridged volume correction table of the A.S.T.M. was also adopted.

Copies of the N.G.A.A. specification card can be obtained from the offices of the association, 819 Wright Building, Tulsa.

Texas Gasoline Production Shows Decline in January

AUSTIN, Tex. — A total of 142 natural gasoline plants were in operation during January, 1938, according to the January report of the Railroad Commission of Texas. These plants processed daily a total of 691,470,000 cubic feet of sweet dry gas, 652,598,000 cubic feet of sour dry gas, and 918,579,000 cubic feet of casinghead gas.

Daily gasoline production during the period was 2,047,622 gallons, or a recovery of .905 gallon per 1,000 cubic feet of gas. This compares with 2,053,224 gallons daily in December. Also produced in January were 331,117 gallons of butane-propane daily.

The report also stated that 40 carbon black plants were in operation during the month, processing 2,262,647,000 cubic feet of gasoline plant residue daily. Daily average production of carbon black amounted to 1,275,751 pounds, or an average recovery of 1.472 pounds per 1,000 cubic feet of gas processed.

California Natural Gasoline Output Higher in January

Natural gasoline production in California during January, 1938, increased 2,000 bbls. daily to 44,000 bbls. daily and stocks increased 114,000 bbls. to 2,115,000 bbls. on January 31. Liquefied petroleum gas production was 2,652 bbls. daily of which 1,074 bbls. daily were produced at refineries. Sales were 2,592 bbls. daily. The summary of natural gasoline production by fields for the month is as follows:

NATURAL GASOLINE PLANT OPERATIONS

Field—	Gas treated (M.C.F.)	Nat. gasoline produced (gallons)
San Joaquin Valley:		
Belridge	4,499,492	2,643,459
Elk Hills	56,365	113,840
Kettleman Hills	10,504,030	15,945,568
Midway-Sunset	1,170,131	2,094,960
Mountain View	550,986	617,900
Miscellaneous	1,111,086	497,915
Coastal district:		
Elwood	749,821	1,013,065
Rincon	140,868	218,079
Santa Maria	167,096	500,252
Ventura Avenue	3,888,246	5,322,588
Miscellaneous	646,492	535,672
Los Angeles Basin:		
Brea Olinda-Coyote	663,853	1,484,558
Dominguez	2,132,320	3,246,584
El Segundo	532,528	844,899
Huntington Beach	1,399,353	3,630,986
Inglewood	291,958	427,119
Long Beach	1,582,776	6,804,546
Montebello	362,557	417,321
Richfield	249,585	613,772
Rosecrans	443,074	794,042
Santa Fe Springs	2,267,992	5,592,478
Seal Beach	468,839	691,306
Torrance	103,473	234,493
Miscellaneous	1,411,548	2,519,911
Total (all fields)	35,031,912	56,805,313

Pipe Line Activity

I.C.C. Tentative Valuation On Humble Pipe Line

WASHINGTON, D. C.—The Interstate Commerce Commission has placed a tentative value of $59,500,000 on the property of the Humble Pipe Line Co., owned and used for common carrier purposes. The valuation is as of December 31, 1934.

Equipment Unloaded for Line to Vacuum Pool

FORT WORTH, Tex.—Equipment has been moved in and the first carload of pipe unloaded for the line to the Vacuum pool, southwest of Lovington in Lea County, southeastern New Mexico, to be laid by Oklahoma Construction Co. for New Mexico Pipe Line Co. It will be 8-inch and 14 miles long, tying in with 4 miles of 4-inch in operation at Lynch station, 18 miles southwest of the Vacuum pool.

Protest Against Proposed Line To Saginaw Bay Terminal

SAGINAW, Mich.—Proposals of the United Fuel Oil Co. of Detroit for a pipe line extending out into Saginaw Bay to a moored terminal from which lake tankers would take oil from the Clayton and Adams fields of Arenac County and the Ogemaw and West Branch fields of Ogemaw County have drawn a barrage of protests from owners of summer resort property on and near Point Lookout, a wooded peninsula projecting out into the west side of Saginaw Bay—in fact, forming the boundary between the bay and Lake Huron.

Application for a permit for the 1,500 feet of the line which would lie under the bay and for the 30-foot caisson which would form the terminal, has been filed with the War Department and the Michigan Conservation Commission. It is probable hearings will be conducted at either Saginaw or Bay City to give the protestants opportunity to voice their objections.

The pipe line would carry three lines, two for oil and the third a return pipe through which the tankers could discharge their bilge water ballast after mooring at the loading terminal.

Besides Point Lookout summer resorters, protests have been made by the cities of Saginaw, Bay City and Midland, which for several years have been working on a plan for a joint water supply from Lake Huron, within a few miles of the proposed tanker terminal. The state Stream Control Commission, an adjunct of the State Conservation Department, is expected to join the protest.

Welding a California line

INTERNATIONAL NEWS

Exporters Interested in Czechoslovakian Agreement

American exporters of petroleum products, particularly lubricating oil, into Czechoslovakia, will benefit from the reciprocal trade agreement just signed with that country. The Czechoslovakian duty on heavy lubricating oils has been reduced by nearly one-quarter and the duty on medium weight oils has been bound at the level of the special duty heretofore given to Rumanian oils of this weight. Mineral oils described in the Czechoslovakian tariff as "of a density of more than 790 degrees up to 880 degrees, semi-refined (semipurified) or refined (purified) light," when imported from the United States hereafter will have a duty of 53 crowns per 100 kilos, equal to about 18.8 per cent ad valorem. In the past, oils of this description have had a duty of 53 crowns when from Rumania and 75 crowns when imported from other countries. On mineral oils described as semi-refined or refined of a density of more than 880 degrees, the duty on American imports will be 65 crowns per 100 kilos, the equivalent of 20 per cent ad valorem, instead of the former rate of 85 crowns. In discussing this change, the state department said:

"All refined mineral oils of the same specific gravity are dutiable at the same rate in the Czechoslovak tariff, including lubricating oils of which the United States is the principal supplier. The duty on medium weight oils has been reduced by about one-third in a commercial agreement with Rumania, but the general rate still applies to the heavy oils, which include most of the lubricating oils. The conventional duty previously accorded to Rumania was bound to the United States in this agreement, and the duty on the heavy oils was reduced by nearly one-fourth, bringing the ad valorem equivalents of the two duties on lubricating oils into line at approximately 20 per cent ad valorem in each case. These duties are levied on the actual weight of the oil excluding all containers, but if oil is imported in tins, the duty on tinned-sheet ware, which is many times higher, is assessed on the whole weight of the containers and contents. The difference is refunded if the containers are reexported, but since the oil is sold at retail in the tins, obtaining the refund is usually out of the question. This procedure now makes it practically impossible to import lubricating oil in tins. The Czechoslovak container provisions were discussed, and informal assurance was given that the Czechoslovak authorities are contemplating adapting their container provisions to the recommendations of the League of Nations. This development should eradicate the difficulty and the like difficulties that occur with respect to paints, dyes, and similar products."

Negotiations to Compromise Mexican Wage Dispute

A compromise between the oil companies and petroleum workers in Mexico appeared last week as the ultimate solution of the dispute which has been in progress since December when a committee appointed to investigate the financial ability of the companies to pay a recommended 30 per cent advance in wages and social benefits.

Unofficial conferences were in progress last week and there is general belief a compromise will be welcomed. It is understood negotiations are going forward on a proposal that if the companies yield in part on the wage issue the workers would abandon the demand for a larger share in administration. The negotiations followed intervention of the First District Court which issued an injunction March 8 preventing the Labor Board from enforcing the Supreme Court decision which in effect granted employes their wage demands.

The injunction was to have been continued or dissolved at a hearing March 12 at which competency of Section 7 of the Federal Labor Board was at issue. After the injunction was issued much government pressure was exerted on Judge Manuel Bartlett even to the extent of removal proceedings being discussed.

Telling 32 senators who visited him that he was determined to enforce the Supreme Court's ruling, "come what may," President Cardenas declared:

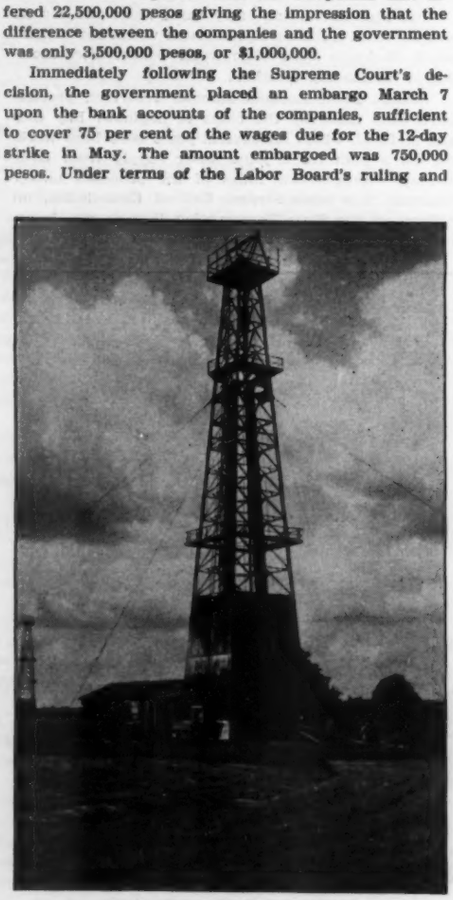
"This government is facing one of the most transcendental moments of its life. . . . Petroleum companies have intervened in the political and economic affairs of our country and have never recognized their debts under concessions granted by Mexico's former dictators. . . . It is worth while to meet the present difficulties in order to terminate forever the economic and political domination of the petroleum companies. These companies have always shown absolute lack of the spirit of conciliation since they withdrew their accounts from Mexican banks and executed other financial manoeuvers causing economic difficulties.

"I consider it a patriotic duty to grasp this opportunity the companies themselves offer, since the country will come out the winner. Each step the government will take has been considered and not a single difficult situation can develop that this government cannot solve. The situation of the country is good. No one should become alarmed. With the cooperation of all elements we shall solve our difficulties."

President Cardenas insisted he had promised to hold the companies' wage cost increases to 26,000,000 pesos annually, instead of the 41,000,000 pesos the companies contend the Supreme Court's ruling will cost them. He repeated that the companies had offered 22,500,000 pesos giving the impression that the difference between the companies and the government was only 3,500,000 pesos, or $1,000,000.

Immediately following the Supreme Court's decision, the government placed an embargo March 7 upon the bank accounts of the companies, sufficient to cover 75 per cent of the wages due for the 12-day strike in May. The amount embargoed was 750,000 pesos. Under terms of the Labor Board's ruling and the Supreme Court's decision, the companies are liable for $6,000,000 in regular and back wages covering the period since the strike last May.

The government has made no move so far to take over the properties of oil companies. It is felt the government lacks the equipment from a physical standpoint as well as trained personnel to handle the $450,000,000 petroleum industry. There is also the question of refining, marketing and transportation to foreign consumers which the government is not equipped to handle.



In Nienhagen field, Germany

Threatened Blow-Out in Test In Kuwait, Asia, Field

Kuwait Oil Co., a near-eastern concern jointly owned by Anglo-Iranian Oil Co. and Gulf Oil Corp., has encountered a high-pressure horizon carrying an undetermined volume of approximately 34 degrees A.P.I. gravity crude oil in the independent kingdom of Kuwait on the extreme northeastern tip of the Persian Gulf.

Oversoming threats of a blowout from total depth of 3,682 feet, Kuwait Oil Co. is now cementing a string of 11¼-inch casing at approximately 3,000 feet. Later, the company will drill cement plug, which extends from around 3,000 feet to the total depth, and set a string of 8-inch pipe just above the zone in which oil was encountered.

When the threatened blowout occurred operators had only 700 feet of 15-inch casing in the hole. Mud density was increased rapidly to avoid trouble, but the well did produce a small amount of oil before it was finally brought completely under control.

The well in which the favorable showing was encountered is Kuwait Oil Co. No. 1 Burghan, on the south side of Kuwait Bay and about 50 miles south of the company's No. 1 Bahrah which was abandoned in 1937 at about 7,950 feet without encountering commercial showings of oil or gas. The second test was spudded last October after a recheck of geophysical information with log of the first hole. The first test was definitely proven off structure. In this connection, it is pointed out that the nature of limestone in the Persian Gulf district offers an extremely unsatisfactory reflection surface.

The zone from which the pressure and oil showing developed in Kuwait correlates roughly with the productive horizon on Bahrein Island and on the Arabian coast.

Development of Barco Concession Is Making Satisfactory Progress

Development is proceeding at a rapid pace on Colombia Petroleum Co.'s Barco concession in eastern Colombia from which a pipe line outlet to deep water will be completed before the end of this year. Colombian Petroleum Co., jointly owned by Socony-Vacuum Oil Co. and the Texas Co., is operating four rigs in proven portions of the concession and is drilling a wildcat test about 4 miles southeast of Petrolia field production.

The last two completions registered by Colombian Petroleum Co. rank among the largest wells yet drilled. Colombian No. 5 De Oro, in the northern part of the concession near the Venezuelan border, was completed December 29 for gauged production of 931 bbls. in six hours, or at the rate of 3,805 bbls. per day. The well is producing from total depth of 1,332 feet.

In the southern part of the Barco, Colombian Petroleum No. 18 Petrolea was completed from a shallow sand not previously developed at 460 feet total depth. The well produced 60 bbls. of oil per hour, or at the rate of 1,440 bbls. daily. No. 19 Petrolea is nearing completion.

The company's wildcat test, known as No. 1 Leoncito, was last reported drilling at about 2,560 feet.

Conference on Metering Crude Oil and Products

The School of Mechanical Engineering, University of Oklahoma, is cooperating with the Petroleum Division of the American Society of Mechanical Engineers in arranging the program for a "Conference on the Metering of Crude Oil and Its Products." The conference will be held at the University of Oklahoma, April 7 and 8, and anyone interested in the metering of oil may attend.

The refining branch and the marketing branch of the petroleum industry have been metering the quantity of flow of certain petroleum products for several years; and during the past years an extensive experimental program on the metering of crude oil and its more viscous products has been in progress in the petroleum industry. The A.S.M.E. has also sponsored a research project at the University of Oklahoma to "determine coefficients applicable to the measurement of the flow of oil when using differential types of orifice, nozzle, and venturi throat flow meters."

Recently it has become apparent that engineers of the industry, as well as representatives of manufacturers of metering equipment, desire means whereby they can review the experiences of oil companies in using the different types of meters, and study problems pertaining to the metering of crude oil and its products. With these two thoughts primarily in mind, the subcommittee of the fluid meters committee of the A.S.M.E., after a meeting at Tulsa, January 3, decided that the scope of its activities would include a study of all types of fluid meters, which might be used for measuring petroleum products and the problems involved in metering crude oil. The committee also approved a conference for the purpose of crystallizing the ideas on the metering of crude oil and its products.

At the conference, the following subjects will be presented for discussion: The principles of metering oil; a general explanation of the principles and the operation of each type of meter which might be adapted to the needs of the industry; the limitations of the uses of different types of meters; the application of meters to the measurement of flow, which the engineers of the industry wish to make; and the problems involved when using meters to measure the flow of crude oil.

During the two-day period there will be four sessions with discussions and papers on the following subjects:

First day—morning—The various types of meters and the principles involved in the metering of crude oil.

Afternoon—The metering of crude oil related to pipe line flow.

Second day—morning—The metering of petroleum and its products in the refinery.

Afternoon—Metering, as related to the production branch of the industry.

The men who will present the papers will be selected from engineers of the industry and from the university staff.

Tretolite Wins Suit in Los Angeles Court

In an opinion handed down in Los Angeles, Federal District Judge Harry A. Holizer found U. S. patent No. 1,467,831, relating to a process for removing water and emulsion from crude petroleum oil by means of chemicals, to be valid and infringed. The opinion was delivered in the case of the Tretolite Co. and others, plaintiffs, vs. Research Products Co., Ltd., and others, defendants. This suit was filed in November, 1933; and was tried before United States Commissioner David B. Head, sitting as special master, in 1935. The particular reagent used by the defendants is known as "Hydrate 488."

The opinion confirms the findings and conclusions contained in the master's report, which was filed in 1936. Judge Holizer's opinion states:

"The court concludes for the reasons herein set forth, as well as upon the grounds stated in the master's report, that the exceptions taken by the defendants to the master's findings and report should be overruled and that a decree should be awarded to plaintiffs as recommended by the master."

The master's report recommended that "a decree be entered in accordance with the foregoing conclusions, that an injunction issue restraining the defendants from the acts found to infringe letters patent No. 1,467,831 and that an accounting of profits and damages be had."

The chemicals involved in this decision are in wide use in the oil fields of the world for breaking crude oil emulsions.

Cash Dividend Payments For First Quarter of Year

Cash dividend payments by the companies in the Standard Oil group for the first quarter of this year will aggregate $23,551,120, compared to $25,437,708 in the similar period last year, according to a compilation made by Carl H. Pforzheimer & Co., members of the New York Stock Exchange. This represents a decrease of $1,886,588, or about 7.5 per cent.

A majority of the companies making payments this quarter are paying the same amounts as in the similar period last year. The only major company in this group to pay less will be Standard Oil Co. of Indiana, which declared only the regular quarterly dividend of 25 cents, while in the initial quarter of last year the company supplemented the regular payment with an extra dividend of 15 cents a share.

South Penn Oil Co. this quarter will pay an extra dividend of only 12½ cents a share, compared to 22½ cents last March. Buckeye Pipe Line Co. will distribute 75 cents a share, against $1 in the March quarter last year, while Southern Pipe Line Co. dividend of 15 cents a share is compared to 20 cents paid a year ago.

The reductions by these companies were offset partly by the larger dividend of Standard Oil Co. of California, the only member of the group that will make a larger distribution in the current quarter than in the corresponding period last year. Standard of California will make a distribution of 35 cents a share, including 10 cents extra, compared to 30 cents a share a year ago.

Socony-Vacuum Oil Co., Inc., Humble Oil & Refining Co., Atlantic Refining Co., Standard Oil Co. of Kentucky, and Standard Oil Co. of Ohio are among the members of this group making the same distributions as a year ago.

Two Killed by Explosion In Plant Near Bradford

BRADFORD, Pa.—D. H. McQueeney, president of Eastern Products Glycerine Co., owner of the plant, and an employe, Ralph Mong, were blown to their deaths by an explosion which destroyed a nitroglycerine plant at Lafayette.

THE MARKETS*

CRUDE OIL: *Several of the large crude buyers are reported to be taking more crude than they require for March and further proration by these companies may be announced before the end of the month. Preliminary reports indicate there will be little increase in demand for crude oil during April. California situation causing considerable concern.*

REFINERY: *Some improvement noted in demand for gasoline at several points with Mid-Continent market stronger. No further advances in natural gasolines. Improved demand for kerosene and tractor fuels. Fuel oils generally weak.*

TANK-WAGON AND POSTED DEALER: *No general changes in gasoline, despite weak situation in retail markets.*

FINANCIAL: *Several stocks decline to lowest point in over two years. Average for 30 representative stocks for week ending March 12: High, 29.28; low, 27.62; close, 27.99. Week ending March 5: High, 30.41; low, 28.98; close, 29.26.*

*Detailed information in market section.

SPECIAL SECTION

Special Section featuring papers, and abstracts of papers, presented before the 1938 annual meetings of

The American Association of Petroleum Geologists

The Society of Economic Paleontologists and Mineralogists

and The Society of Exploration Geophysicists

Nova Scotia Gasoline Tax To Be Dime a Gallon

HALIFAX, Nova Scotia.—To provide for highway development, the Nova Scotia government is planning to increase its gasoline tax from 8 to 10 cents per gallon. To offset the increase the government has tentatively arranged for a 1½-cent reduction in the wholesale price in Halifax and Sydney and 2 cents elsewhere.

Gas-Oil Ratios Announced For Pools in West Texas

AUSTIN, Tex.—The railroad commission has made an order prescribing gas-oil ratios for seven pools in West Texas.

The ratios ordered, with the changes, follow: North Cowden, 3,500 feet to a barrel of oil, down 1,500 feet; Goldsmith, 5,000 feet, down 1,000 feet; Kermit, 3,000 feet, down 500 feet; Keystone, 8,000 feet, unchanged; North Ward, 5,000 feet, down 500 feet; Fuhrman, 5,000 feet, up 3,000 feet; South Ward, 5,000 feet, down 500 feet.

The commission also announced dates for beginning quarterly gas-oil ratio tests for fields in the following counties:

Winkler, March 31; Ward, April 30; Gaines, Yoakum, Cochran, Andrews and Hockley, May 31; Ector, June 30; Loving and Pecos, July 31; Crane and Upton, August 31.

The American Association of Petroleum Geologists

TWENTY-THIRD ANNUAL MEETING

The Society of Economic Paleontologists and Mineralogists

TWELFTH ANNUAL MEETING

The Society of Exploration Geophysicists

NINTH ANNUAL MEETING

In session at the Roosevelt Hotel, New Orleans, March 16, 17 and 18, 1938

PAPERS AND ABSTRACTS

Future of Geologists in Petroleum Industry

By H. B. FUQUA

President, American Association of Petroleum Geologists*

Article 2 of the constitution of the American Association of Petroleum Geologists reads as follows:

"The object of this association is to promote the science of geology, especially as it relates to petroleum and natural gas; to promote the technology of petroleum and natural gas and to encourage improvements in the methods of exploring for and exploiting these substances; to foster the spirit of scientific research amongst its members; to disseminate facts relating to the geology and technology of petroleum and natural gas; to maintain a high standard of professional conduct on the part of its members; and to protect the public from the work of inadequately trained and unscrupulous persons posing as petroleum geologists."

"Theories" Justified

How well our association has fulfilled the several mandates set forth in that article is recorded in the hundreds of constructive manuscripts penned by its members which to a marked degree have promoted the science of petroleum geology, the technology of petroleum and natural gas, and the several other worthy scientific objectives set out therein. A year-to-year perusal of the association's literature in conjunction with a history of the petroleum industry will clearly show that our theories of "today" become the platitudes of the industry's "tomorrow." The much criticized anticlinal theory of White is now the basis of executive thought. The gas associated with an oil field, not long since considered by practical oil men as a necessary evil associated with the production of oil, is now looked upon as one of the principal if not the deciding factor in the ultimate recovery from a field. Our literature is filled with theoretical and practical discussions on this subject. A decade ago it was only through most strenuous efforts that operators could be persuaded to save drill cuttings. Today it is as much a part of drilling routine as is the actual drilling of the well itself. Who will hazard a guess as to what the ultimate recovery of Smackover, of Cushing, or of Hendrick, might have been had the geologists' theories on conservation of gas energy and control of water drive been accepted and practiced during their development? These examples could be multiplied ten fold. Each is the story of a theory of "today," accepted a day too late.

However, that they have been accepted finally and put into daily practice is due to the tireless labor of an association of earnest scientists and to *salesmanship*. The principal labor of developing the original theories of the science of petroleum geology has fallen to that part of the association's membership who may be designated as "Pure Scientists." They have been associated with federal and state surveys, with universities, and with research departments of various large corporations. The equally important and difficult task of finding practical application for these theories and, when found, of selling them to the practical men of the industry, has fallen to the lot of those who, through the nature of their business connections, necessarily must give more thought to the economic aspects of their profession. Due to changing conditions in the oil industry, it is becoming increasingly necessary to place more and more stress on drilling and producing procedure. In the future a considerable portion of its profits is going to be made by utilizing more scientific and efficient methods of production. Because of the scientific information concerning subsurface conditions which active field and office geologists possess, they are in a strategic position to render a valuable service to and at the same time enhance the profits of the industry. It is primarily to this class of our membership the following remarks are addressed.

The average petroleum geologist of this class recognizes correctly as his primary functions the study of earth history and the discovery of commercial deposits of oil and gas. However, it is a fact that this represents only a minor part of the services which, by training and experience, he can and should contribute to the petroleum industry.

The present so-called "recession" which can very easily develop into another serious depression suggests urgently that the geologist take inventory of what he has to offer in the way of subsidiary services in order to avoid a repetition of the serious unemployment which shattered our ranks in the recent economic hiatus of 1929-1933. And having made this survey, a real problem of education and salesmanship confronts those among us who exert more or less influence in the industry. It has been the general experience of those who have been engaged in corporate work that the average executive, trained in business administration and leadership rather than in the infinite details of science, will welcome proffered assistance and, in a majority of cases, will furnish necessary personnel to carry out the functions discussed below.

Observation has shown that many of the most elementary functions of our profession are not properly utilized in certain corporate setups.

The chief supplementary services available through geological cooperation are as follows:

1. Cooperation with the executive department.
2. Cooperation with the production department.
3. Cooperation in geophysical work.
4. Cooperation in legal problems.

Conclusion

There are no doubt other fields of endeavor wherein our profession may find room to expand. However, the suggestions made offer at least a working basis for constructive thought. We have reached a new peak in membership, in output of manuscript, and, it is sincerely believed, in technique and ability. Whether or not we shall reach greater peaks during the coming years is dependent upon the membership itself, upon their ability to give better and better service along old established lines and to convince the industry that they are needed—and needed badly—in certain supplementary lines of endeavor, the potentialities of which have, as yet, been barely scratched.

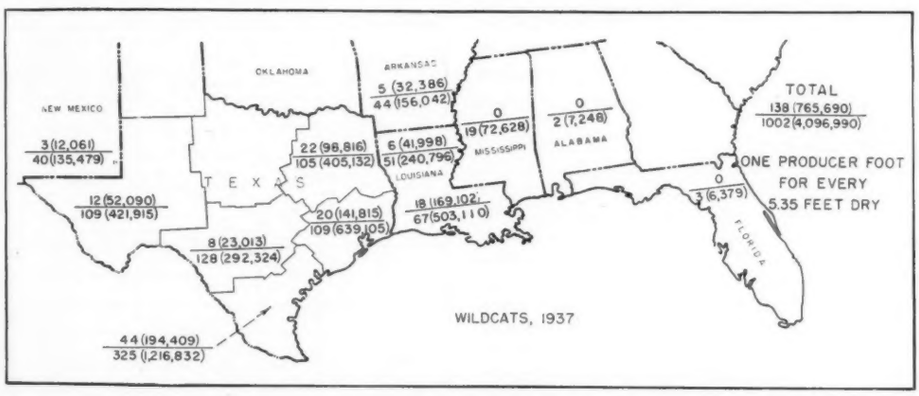
*Presented before the association at the New Orleans meeting, March 16, 1938.

WILDCAT DRILLING in 1937

By FREDERIC H. LAHEE
Sun Oil Co., Dallas, Tex.

LAST year a brief study was made of the statistics of wildcat drilling in southeast New Mexico, all of Texas except the northwest part where data were not available, Louisiana, southern Arkansas, Mississippi, Alabama, and Florida. Information was collected for the years 1935 and 1936, and it was shown that between 89 and 93 per cent of all wildcats were dry. (See A.A.P.G. Bulletin, Vol. 21, pp. 1079-1082.)

Figures for 1937, for the same area, are now on hand. In most cases these figures are used only for holes drilled outside of known pools, and sufficiently far from production to be regarded strictly as tests of unproved stratigraphic and structural possibilities, and not as short extensions of mapped pools. However, in a few instances, discovery wells of different sands on the same structure have been included, where this structure had not yet been fully outlined. An example of this kind is that of the discovery wells of the three pay zones in the Shuler field in Arkansas. Also, on some of the Gulf Coast salt domes, already at least partially outlined by earlier drilling, certain deep-sand discoveries have been rated as wildcat. Along the southwestward extension of the Rodessa fault, several producers have been listed as wildcats because they were separated from known production by several miles. In other words, the classification used herein leans toward the conservative side, for discovery wells, somewhat raising the percentage of wildcat producers and lowering the percentage of dry holes.



Footage drilled in productive and unproductive wildcat tests in southern area during 1937

Footage Drilled

In preparing the map, both oil wells and gas wells are together shown as producers. In the accompanying table, oil wells and gas wells are listed separately, under the several states or districts, but the footage of these holes is combined. For purposes of comparison, the holes and footage have been totaled by provinces, designated A, B, etc. The grand total reveals that 765,690 feet of hole were drilled in 138 discovery wildcat wells, as contrasted with 4,096,990 feet in 1,002 dry holes. This means that just over 12 per cent of all wildcats drilled in 1937 were producers, the other 88 per cent being dry. For every producer foot drilled, 5.35 feet of dry hole were drilled. This is a better record than that of 1936 when one producer foot was drilled for every 6.83 feet of dry hole.

In the past two or three years there has been a tendency in some quarters to try to cut down the excessive cost of wildcat drilling by first exploring with a small hole, let us say 5 or 6 inches in diameter, carried to depths as great as 7,000 or 7,500 feet, and then, if electrical logging and side-wall sampling seem to warrant a test for oil, following this small-hole drilling by a hole large enough to complete with adequate casing for production purposes.

It is of some interest to compare the two methods, namely, that of drilling all wildcats with a hole large enough to complete as a producer if oil or gas is discovered, and that of drilling all wildcats as small exploratory holes to be followed by a second large hole where indications point to possible commercial production. In making this comparison, let us assume (1) that the average cost of drilling the small hole is $2.50 per foot; (2) that the average cost of drilling the large hole is $7.00 per foot; and (3) that in all the cases listed, the producing horizon would be found in the small exploratory hole. In these assumptions, the 4,096,990 feet of dry hole plus the 765,690 feet of producers would have cost $12,156,700 for small-hole drilling, or $34,038,760 for large-hole drilling; and the additional large holes for the discoveries would have cost $5,359,830. Therefore, for the first method the total cost would have been $34,038,760 and for the second method (small hole plus large hole where oil is found), $12,156,700 plus $5,359,830 or $17,516,530, which is roughly half the cost of wildcat drilling by the present large-hole method.

These figures are taken to represent drilling to depths of 6,000, 7,000, or 8,000 feet—roughly speaking. The same principle is applicable to shallower drilling, or to deeper drilling. It is true that there are certain objections to this small-hole drilling—certain risks of missing pay sands; but in any event, structural and stratigraphic information may be secured more cheaply than by the large-hole wildcat. The procedure is worthy of very careful consideration as a means of reducing the huge costs of wildcat drilling.

Summary

In checking over the reasons for drilling these wildcats in 1937, we find that:

Fifty producers and 414 dry holes were located on geological information (surface, subsurface, trend, core drilling);

Fifty-three producers and 138 dry holes were located on geophysical evidence (seismograph, torsion balance, magnetometer, gravity meters, or combinations);

Nine producers and 43 dry holes were located on combined geological and geophysical evidence;

Thirteen producers and 220 dry holes were pure wildcats, with neither geology nor geophysics to guide the selection of their sites;

Thirteen producers and 185 dry holes were located for reasons not known to those who assembled the information.

Of significance is the fact that only 5.9 per cent of the holes located without technical basis were producers, whereas 18.8 per cent of all the holes located on geology or geophysics were producers of oil or gas. Locations based on technical advice were more than three times as successful as locations made without such advice.

As we pointed out last year, there is much food for thought in figures such as these herein presented. Again we urge that an analysis of this kind be made each year for all important oil-producing districts in the United States.

WILDCATS, 1937

District—	Producers: Oil	Producers: Gas	Producers: Oil and gas	Total footage of oil and gas wells	Dry holes	Total footage
1. Alabama	0	0	0	0	2	7,248
2. South Arkansas	5	0	5	32,386	44	156,042
3. Florida	0	0	0	0	3	6,379
4. North Louisiana	1	5	6	41,998	51	240,796
5. South Louisiana	13	5	18	169,102	67	503,110
6. Mississippi	0	0	0	0	19	72,628
7. Southeast New Mexico	3	0	3	12,061	40	135,479
8. Northeast Texas	16	6	22	98,816	105	405,132
9. Southeast Texas	13	7	20	141,815	109	639,105
10. Southwest Texas	31	13	44	194,409	325	1,216,832
11. San Antonio, Texas	8	0	8	23,013	128	292,324
12. West Texas	12	0	12	52,090	109	421,915
Totals—						
A. 1+3+6	..	..	0	0	24	86,255
B. 2+4+8+11	..	..	41	196,213	328	1,094,294
C. 5+9	..	..	38	310,917	176	1,142,215
D. 10	..	..	44	194,409	325	1,216,832
E. 7+12	..	..	15	64,151	149	557,394
Grand total	..	..	138	765,690	1,002	4,096,990

Average depth of hole $\frac{765,690}{138} = 5,548$ feet. $\frac{4,096,990}{1,002} = 4,089$ feet.

On Basis of Total Holes Drilled 100 Per Cent and Total Footage Drilled 100 Per Cent

	Per cent producing	Per cent dry	Per cent producing footage	Per cent dry footage
A.	0	100	0	100
B.	11.111	88.889	15.204	84.796
C.	17.757	82.243	21.395	78.605
D.	11.924	88.076	13.775	86.225
E.	9.146	90.854	10.321	89.679
Total	12.105	87.895	15.746	84.254

THE ECONOMIC ASPECTS OF DRILLING

By JOSEPH E. POGUE
Vice President, Chase National Bank, New York City*

The rate of oil-field drilling in the United States is one of the key factors in the equilibrium of the petroleum industry. Since the trough of the depression in 1931-33, the number of well completions has increased at a geometric rate, attaining a level of 32,812 in 1937; and the drilling momentum has been such as not only to involve the employment of much unneeded capital in the production department but also to constitute a flaw in the functioning of proration and a risk to the stability of the business. It is the purpose of this paper to analyze the normal incentives to drilling and, by showing the recent departure of the drilling curve from its associated factors, to emphasize and measure the entry of unstabilizing influences; and, finally, to point the issue by projecting the probable course of the production per well in the state of Texas.

Part 1—Correlation Analysis

It is obvious that the drilling rate is responsive to the price of crude oil, the volume of required production of this commodity, the level of general business, and the availability of newly discovered oil fields, as well as to other factors not so readily

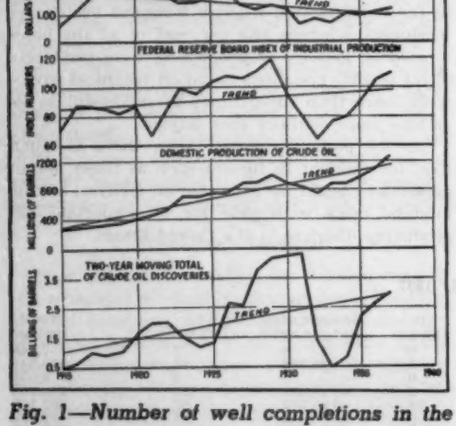


Fig. 1—Number of well completions in the United States by years, 1915-1937, together with four associated statistical series

reducible to quantitative terms. The former group of statistical influences has been operative for a long period; but some of the nonstatistical factors, such as those arising under the influence of proration, are relatively recent and are now operating to distort normal relationships and create strains in the industrial structure. The methods of correlation analysis, applied to statistical factors, provide some measure of the importance and incidence of the nonstatistical factors.

The data that have been subjected to correlation analysis are presented in graphic form in Figure 1, and the period selected is 1915-37, inclusive. It will be observed at once that the trends of completions and price are downward, whereas the trends of the Federal Reserve Board Index of Industrial Production, crude oil production, and the two-year moving total of discoveries are upward. The equations of the respective trends are as follows:

Well completions	$X_1 =$	$-151.51\ X_5 + 24{,}895$
Price of crude oil	$X_2 =$	$-3.76\ X_5 + 181.61$
Federal Reserve Board Index of Ind. Prod.	$X_3 =$	$0.57\ X_5 + 84.52$
Crude oil production	$X_4 =$	$39.16\ X_5 + 253.30$
Two-year moving total of discoveries	$X_6 =$	$84.23\ X_5 + 1{,}008$

Where:
X_1 = Well completions in the United States.
X_2 = Weighted average price of crude oil at the well, cents per barrel.
X_3 = Federal Reserve Board Index of Ind. Production, 1923-25 = 100.
X_4 = Production of crude oil, in millions of barrels.
X_5 = Years from 1914.
X_6 = Two-year moving total of discoveries, in millions of barrels.

The relationship between price and completions for the 23-year period under consideration may be shown by means of a scatter diagram (see Figure 2). The equation representing the relationship is: $X_1 = 80.39\ X_2 + 12{,}105$, in which X_1 is the number of completions and X_2 the weighted average price of crude oil at the well expressed in cents per barrel. The coefficient of correlation is +0.76, representing about a 58 per cent degree of conformance, and the average deviation, or error, is ±3,020 wells. Inspection of Figure 2 reveals that the widest deviation from the average relationship is recorded for the year 1937. The chart and equation indicate that price has a smaller effect upon the drilling rate than might be expected from the logic involved. Variations of 10 cents a barrel from current prices indicate an effect upon the drilling rate of only about 800 wells per annum. If the two series are recomputed in terms of deviations from their respective trends and these deviations correlated, the coefficient of correlation is raised to 0.985.

A similar range of computations was made, in turn, for the relationships between completions and the Federal Reserve Board Index of Industrial Production, the domestic production of crude petroleum, and a two-year moving total of oil discoveries—the three remaining series shown in Figure 1. The results of all the separate correlations may be summarized as follows:

Series—	Coefficient of correlation of raw data	Coefficient of correlation based upon deviations from trend
Completions vs. Price	+0.76	+0.985
Completions vs. F.R.B. Index of Ind. Prod.	+0.56	+0.982
Completions vs. Production	—0.02	+0.951
Completions vs. Discoveries	+0.83	+0.852
Completions vs. Four Series combined	....	+0.993

By relating the four series simultaneously to completions, a high degree of conformance is obtained, the coefficient of correlation based upon deviations from trend becoming +0.993. The result of this multiple correlation is shown in Figure 3, in which the heavy line is the actual number of wells completed each year and the dashed line represents the theoretical number that would have been completed if the factors considered represented the entire range of influences and the relationship were perfect. The equation representing the commensurability of the two curves is as follows:

$$X_1 = 70.61\ X_2 + 160.43\ X_3 - 2.84\ X_4 + 155.62\ X_5 - 0.44\ X_6 - 134$$

Where:
X_1 = Estimate of well completions.
X_2 = Weighted average price of crude oil at the well, in cents per barrel.
X_3 = Federal Reserve Board Index of Industrial Production.
X_4 = Production of crude oil, in millions of barrels.
X_5 = Years from 1914.
X_6 = Two-year moving total of discoveries, in millions of barrels.

The average difference between the two curves is 1,754 completions, but it will be observed at once that the maximum deviation is for the year 1937

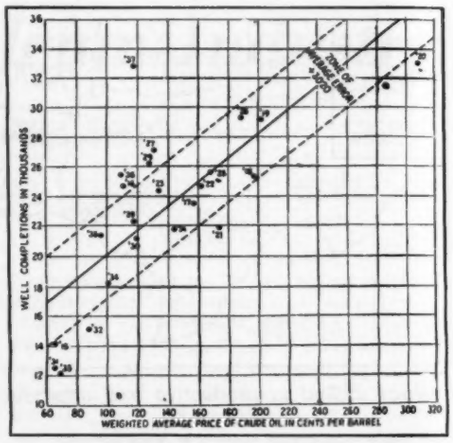


Fig. 2—Scatter diagram showing relationship of well completions in the United States to the weighted average price of crude oil

and that the rise in the completions since 1933 is very much more rapid than the curve of associated factors. In short, the relationship of the two curves during the past four years clearly indicates the operation of influences absent in the earlier period; or, in other words, the drilling rate has come under the stimulus of causes extraneous to price, business conditions, production, and discoveries available for drilling. This circumstance is well known in informed quarters, but the incidence of the development is perhaps not fully appreciated. Among the residual influences affecting the drilling rate are the bunching of lease expirations, a low interest rate, inflation fears, and the uneconomic stimulus of the proration mechanism itself, particularly those phases of its administration that create a motive for drilling wells in excess of those required for effective withdrawal of quotas.

During the four years since 1933, the cumulative increase in the number of completions has been 20,500, whereas the cumulative increase in the indicated number that would have been called for under the formula was 7,678—a difference of 12,822 completions. The number of "unnecessary" wells drilled in the course of the past four years must, accordingly, lie within this spread.

On the basis of an unchanged crude-oil price, a business index of 90, a crude-oil production of 1,260,000,000 bbls., and a continuation of the past

*Presented before the annual meeting of the American Association of Petroleum Geologists, New Orleans, La., March, 1938.

The writer is indebted to Messrs. Norman D. Fitz Gerald and Basil B. Zavoico, department of petroleum economics, Chase National Bank, for assistance in the preparation of Parts 1 and 2, respectively, of this paper.

two-year rate of crude-oil discoveries, the formula indicates a reduction of 3,004, or about 9 per cent, in the number of 1938 completions as compared with 1937. If, however, as seems likely, there is some retardation in the influence of the nonstatistical factors, the indicated reduction would be augmented, suggesting 28,000 to 29,000 completions for 1938.

Part 2—Projection of Per-Well Allowable

The drilling of wells in excess of equilibrium requirements[1] creates a cumulative pressure manifesting itself, under proration, in the form of a declining per-well allowable. As is well known, this pressure finds its most acute reflection in Texas, because of the large ratio of reserves to normal markets, the methods of administering proration, and other factors characteristic of oil conditions in that state. In order, however, to get at an adequate measure of this factor, it is necessary to project the data after deducting from the totals the East Texas situation (which is a unit within itself) and the number and output of pumping wells in the rest of the state. In this way a measure of the pumping wells in Texas, exclusive of the East Texas field, is arrived at. In order to make the computations, it is necessary to assume a specific production rate for the state of Texas. This assumption, in terms of the state's 1937 production taken at 100, is as follows: 1938 = 100; 1939 = 105; 1940 = 110; 1941 = 115; and 1942 = 120. The wells are divided into pumping wells and flowing wells for 1936 and 1937, the data being taken from compilations based upon the records of the Texas Railroad Commission. These two categories of wells, for the East Texas field and for all Texas excluding East Texas, are then projected for five years into the future on the basis of assumed drilling rates and calculated transfers from year to year of a share of the flowing wells into pumpers. The pumping wells are then assigned a horizontally extended unit production, and the remaining production after division by the estimated number of flowing wells yields the estimated daily allowable per flowing well. While it cannot be expected that this projection can be precise, the results are nevertheless believed to have validity within practical limits and therefore to be serviceable as a measure of the problem. The data employed are presented in Figures 4 and 5.

[1]See J. E. Pogue, *An Equilibrium Theory of Proration*, Amer. Inst. Min. & Met. Eng., annual meeting, Feb. 1938, for explanation of the equilibrium concept.

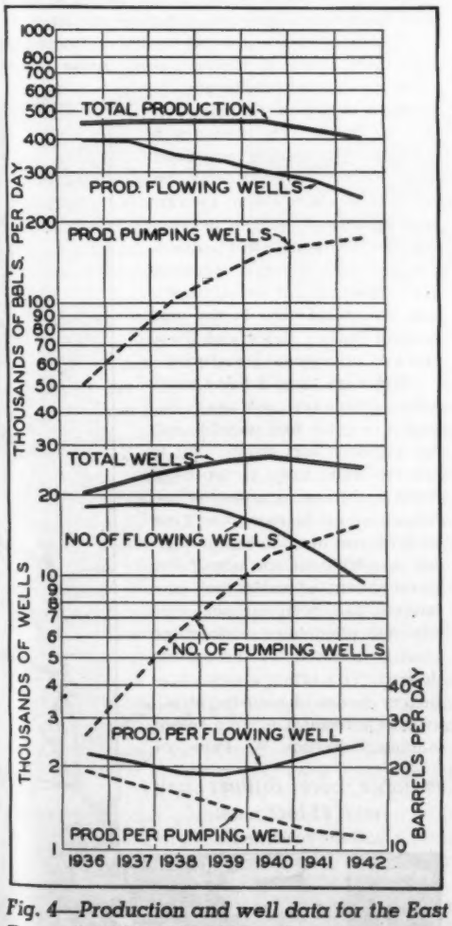


Fig. 4—Production and well data for the East Texas field for 1936-1937 with projections for 1938-1942

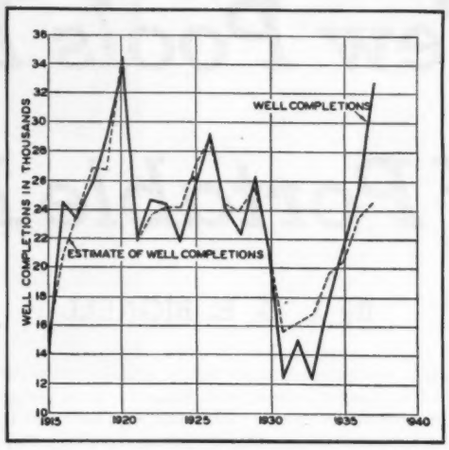


Fig. 3—Relationship between completions and Federal Reserve Board Index of Industrial Production

The East Texas field is of interest in this bearing because of the proximate attainment of the marginal limit of 20 bbls. per well in its unit allowable, with continued drilling in prospect. Figure 4 shows the projected relationship of flowing and pumping wells in this field. The number of pumping wells is expected to exceed the number of flowing wells in 1941. Either the field allowable will have to be raised or else the daily allowable per average well will have to fall below 20 bbls. Perhaps some of the slack can be taken up by the pumping wells, if their capacity for production should decline, but a meticulous discrimination on the part of the regulatory bodies would have to be exercised in this event.

The Sunday shutdown temporized with the problem. The cessation of granting drilling permits or the revision of the marginal well law may receive consideration. All these possibilities render projection difficult, but Figure 4 presents current tendencies and serves to emphasize the difficult problem faced in connection with the proration of the East Texas field.

Figure 5 shows the results of the computations for the state of Texas, excluding East Texas. The number and production of the two categories of wells—flowing and pumping—are shown separately. In calculating the indicated per-well allowable for flowing wells, a daily production of 9.5 bbls. per well for all pumping wells was employed unchanged for the entire period. This figure is the estimated rate of production in 1936, and it is believed that no appreciable decline will take place in this figure, for the reason that new and vigorous pumping wells will be continuously coming into the list and the technique of pumping is undergoing continuous improvement. A small decline, however, if postulated, would not substantially affect the results. On the basis of the assumptions made, the indicated trend of the per-well allowable for flowing wells is as follows:

INDICATED DAILY ALLOWABLE PER FLOWING WELL IN TEXAS, EXCLUSIVE OF THE EAST TEXAS FIELD

(In barrels per day per flowing well)

1936	51.4	1940	33.1
1937	52.1	1941	32.7
1938	40.5	1942	31.8
1939	36.2		

The trend shown above reflects a drastic decline in prospect. This trend could be greatly alleviated if customary spacing patterns were widened. If half the wells contemplated were drilled on the basis of 20 acres per well instead of 10 acres per well, then the new drilling would be reduced by 25 per cent. If the spacing of all the wells were doubled, then the number of new wells would be cut in half. The effect of progressive widening of the spacing pattern upon the per-well allowable may readily be calculated, with results as follows:

INDICATED DAILY ALLOWABLE PER FLOWING WELL IN TEXAS, EXCLUSIVE OF THE EAST TEXAS FIELD, ON BASIS OF WIDER WELL SPACING

(In barrels per day per flowing well)

	1938	1939	1940	1941	1942
Probable	40.5	36.2	33.1	32.7	31.8
Basis 25% cut in drilling	42.1	39.0	36.6	36.9	36.4
Basis 50% cut in drilling	44.2	42.5	41.3	42.6	42.9

The foregoing table brings to a focus the economic advantage of wider well-spacing patterns. Other measures are also available to the same end, such as the introduction of acreage factors into quota calculations, the furtherance of unit operation, and the like. The arrest of the declining per-well allowable, especially in Texas, is no longer an academic problem; the stability of the industry itself is involved.

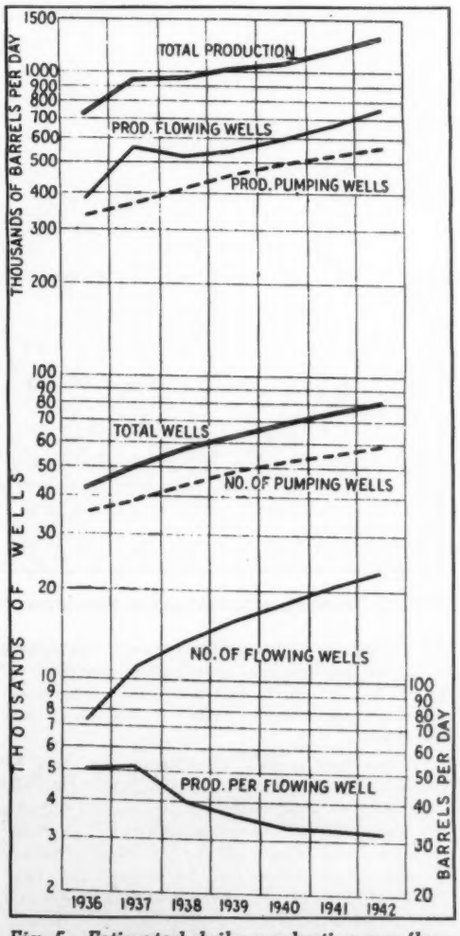


Fig. 5—Estimated daily production per flowing well in Texas (exclusive of East Texas) by years, 1936-1942, together with related data

Finding New Pools Facilitated by Use of Portable Machines

By L. G. E. BIGNELL

The search for oil presents an ever-changing panorama of methods, and while many are asking where the new fields are to be looked for, forward-looking geologists have been planning new procedures to discover oil reserves by systematic search to replace the many pools found by chance. With more than 2,500 trained scientists in the geologic profession of the oil industry aided and abetted by economic geologists and other scientists it is very reasonable to assume that the finding of fresh oil will go on at a pace in keeping with the ever-growing needs of the consumer.

In an article entitled "New Methods Required to Find Future Reserves" in the December 23 issue of The Oil and Gas Journal an advanced theory of oil finding was discussed. Since then it has become apparent the idea has been rather generally accepted but executives and production department heads are asking about these core holes and their cost.

It has been general practice to test areas by geophysics and from $16,000,000 to $20,000,000 per year has been spent in this country during the past five years for such services. Many new oil fields have been opened through the knowledge of underground structures obtained by geophysical exploration. Millions of acres have been considered and rejected as unfavorable after geophysical testing. The method has been found cheap and satisfactory for reconnaissance work but it is known that in many areas explored by such methods the results obtained have not been all that could be desired. Key beds were not favorably located and structural changes were of such character as to remain hidden when attempt was made to find them by geophysical prospecting. This does not imply there is not a very important place for geophysics in the search for oil pools but it is admitted other methods must also be applied if the oil accumulated in stratigraphic traps and hidden pools is to be found.

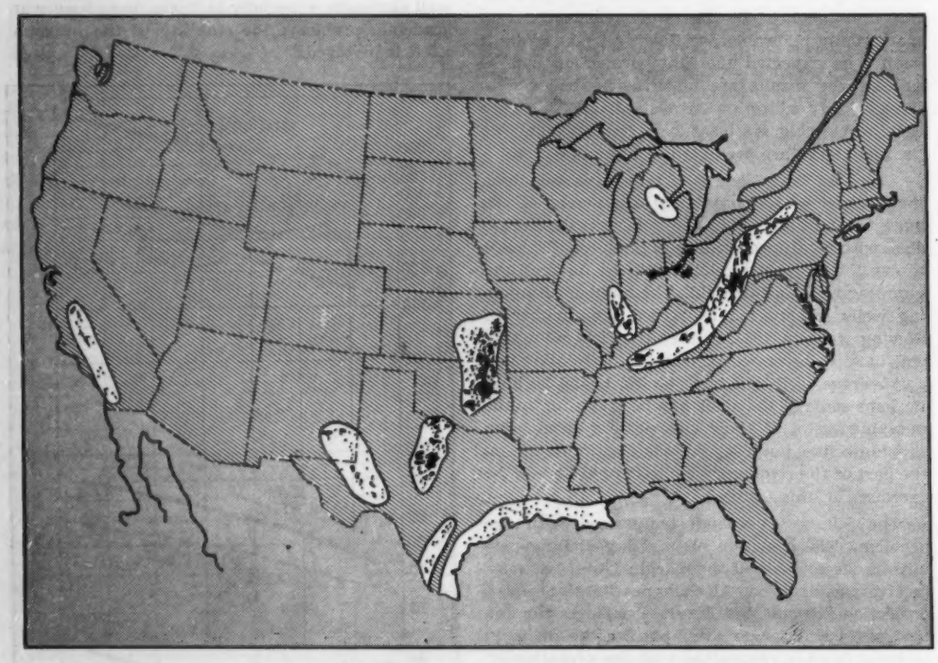
There are really two types of area to be explored with the core drill in seeking new oil fields. One area is the fringe around regional uplifts already productive of gas and oil in fields lying near the crest of the structures. It has been common practice to drill a few wells around the edge of an oil field to determine the limits of production for that particular pool. The area beyond the dry holes was then considered as barren of gas or oil and nothing further was done to test it.

A study of such regions now indicates there is ample unexplored territory out from the known fields which should have producing formations in favorable positions for gas and oil accumulations. It is also predicted deeper pay zones may be found farther out in these basin areas which will pay to explore and which hold promise of many new fields. It is therefore suggested that a series of wells be drilled around the outer edges of known production in such regions as eastern Oklahoma, southeastern Kansas, along the Bend Arch fields in north central Texas and around many of the productive areas of Pennsylvania, West Virginia and Ohio. There is ample evidence to lead to the belief that conditions are satisfactory for the finding of new gas and oil fields in these areas and it is predicted many tests will be located in those regions in the near future. When stratigraphic information has been accumulated by coring such outlying areas it is going to be possible to determine the position of favorable structures for gas and oil accumulation.

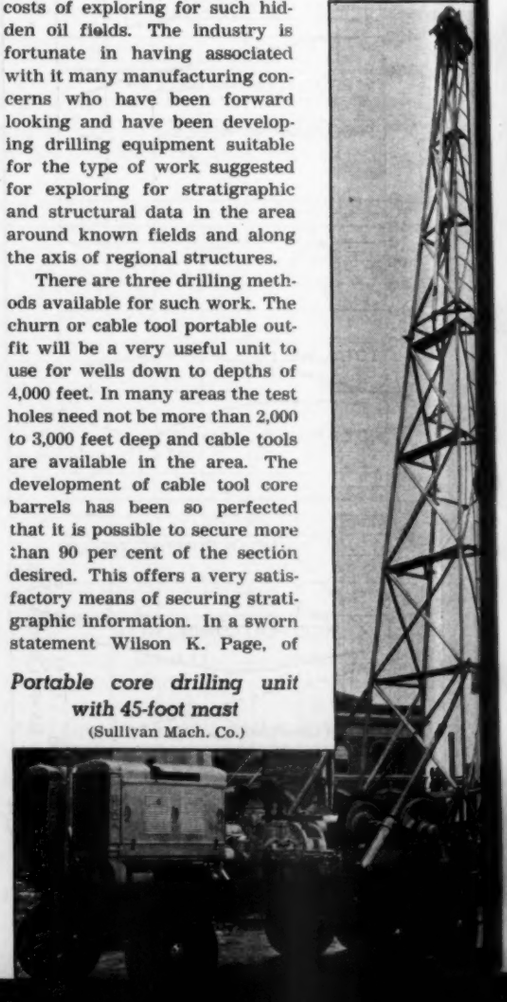
The other type of area to be explored by drilling and coring is at present undeveloped territory but in areas about which much is known of a general geologic nature and some wildcats have been drilled that will furnish some clues for study of conditions on the basin side of regional uplifts. Ancient mountain ranges with adjacent areas of old seas provide ideal conditions for the deposition of sediments and source materials and while they are hard to locate by geophysics a combination of geophysical data, stratigraphic information gained from a few wildcat wells and general geology will do much to guide the geologists in the location of core holes to secure the necessary stratigraphic information to aid in the finding of favorable spots where gas and oil has accumulated.

So much for the general theory of finding oil. The more practical problem confronting the industry is to determine means and costs of exploring for such hidden oil fields. The industry is fortunate in having associated with it many manufacturing concerns who have been forward looking and have been developing drilling equipment suitable for the type of work suggested for exploring for stratigraphic and structural data in the area around known fields and along the axis of regional structures.

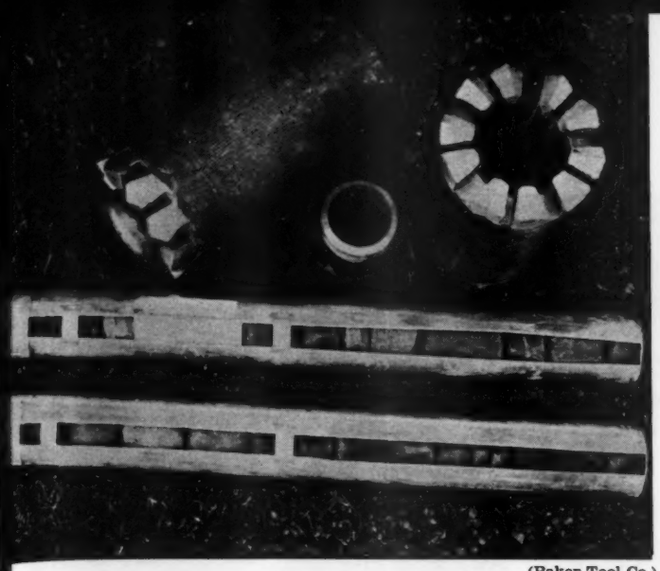
There are three drilling methods available for such work. The churn or cable tool portable outfit will be a very useful unit to use for wells down to depths of 4,000 feet. In many areas the test holes need not be more than 2,000 to 3,000 feet deep and cable tools are available in the area. The development of cable tool core barrels has been so perfected that it is possible to secure more than 90 per cent of the section desired. This offers a very satisfactory means of securing stratigraphic information. In a sworn statement Wilson K. Page, of



Outlined areas around flanks of developed fields suitable for exploration with portable units



Portable core drilling unit with 45-foot mast
(Sullivan Mach. Co.)



(Baker Tool Co.)

Cable tool core barrel with core holders

the Olean Petroleum Co., Olean, N. Y., states that his company cored 650 feet of formation in 13 wells with a No. 6 Baker cable tool core barrel run inside of 6¼-inch 13-pound casing for $8 per foot, including cost of laboratory analyses of the different sand samples, wear and tear on the equipment, the dressing and reconditioning of the shoes, the contractor's labor at $30 for 12 hours per day and depreciation and interest on the investment covering the equipment.

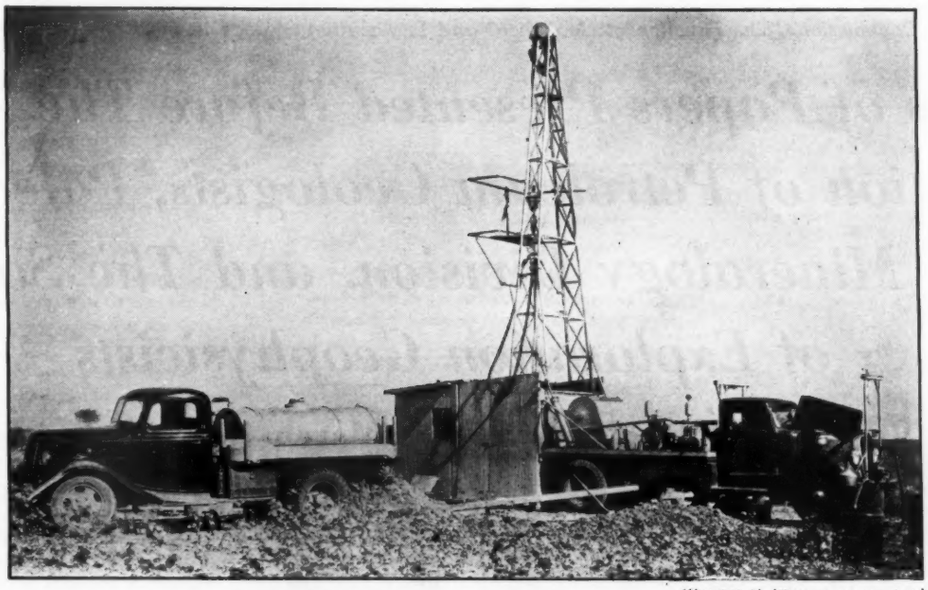
These cable tool outfits are suitable for the exploratory work advocated and the core barrels are available in several sizes to take cores varying from 1⅝ to 3⅛ inches diameter. The drill shoes are made for different sizes of pipe or open hole and no special equipment is needed to hook up the core barrel other than to run a stiff socket and jars between socket and stem.

Another recent development in coring equipment has been made by the Sullivan Machinery Co. in the design of a new heavy-duty type core drill mounted on a trailer and supplied with a mast making it flexible in scope of operations. One of these heavy-duty coring machines of the stationary type recently core drilled to a total depth of 8,102 feet in South Africa and it is understood it is now awaiting orders to proceed to complete the hole to 10,000 feet. This indicates the feasibility of using the coring type machine for any depth desired for exploratory work although it is not anticipated it will be necessary to drill holes more than 4,000 feet in the type of work under consideration.

One of these heavy-duty machines fully equipped with two 75-hp. engines, pumps, trailer, mast and auxiliary equipment suitable for drilling hole for 3½-inch casing, but without drill rods, bits, core barrels, water swivel or tools costs approximately $22,000 f.o.b. factory. Using this type equipment the coring costs compare favorably with straight drilling costs and the machine is finding favor in the Gulf Coast area for drilling holes for the running of the electric coring device.

A still heavier type drilling outfit is available. It is a portable rotary drilling unit mounted upon heavy-duty truck and supplied with two 125-hp. diesel engines. These units are complete with mast, slush pumps, hydraulic feed for drill pipe, drawworks and all auxiliary equipment needed for the drilling of 6¼-inch cored holes to 4,000 feet, or have capacity to drill smaller holes to any depth down to 10,000 feet. Core barrels or regular rotary bits can be used and the speed of drilling with either type equipment will depend upon the type of formation to be penetrated but will compare in speed favorably with standard equipment.

This unit has been developed by Franks Manufacturing Corp. of Tulsa, and incorporates the ideas gathered by several major companies who have used machines of this type for drilling holes for water-flooding projects and later for exploratory work. The machine embodies pump, rotary equipment, hydraulic feed and power units of a balanced design suitable for drilling 6¼-inch holes 4,000 feet. deep. Cost records indicate the 6¼-inch 4,000-foot holes can be drilled for about $2 per foot, all costs included. The machine costs about $32,000 f.o.b. Tulsa and several are now in use on work of the nature outlined in this article in Mid-Continent states and inquiries have been received for shipment of similar machines to foreign countries.



(George E. Failing Supply Co.)

Core drilling unit set up to drill exploratory wells

With equipment available for the exploration of likely areas it is expected that the future course of oil companies will be to do much of this type of work instead of drilling wells with the sole purpose of striking oil. In the long run such work will not be very costly and money so spent will at least add very materially to the knowledge of the regions explored and in time will lead to the discovery of new oil fields of importance.

One of the pioneers advocating the use of core holes and data secured from the study of cores for outlining structure is George E. Failing of Enid, Okla. As far back as 1921 Mr. Failing was using the core drill for securing information upon which to develop knowledge of structure. From that stage his work has developed to take in deep coring, and he now manufactures a complete line of portable drilling outfits suitable for drilling and coring to depths in excess of 5,000 feet.

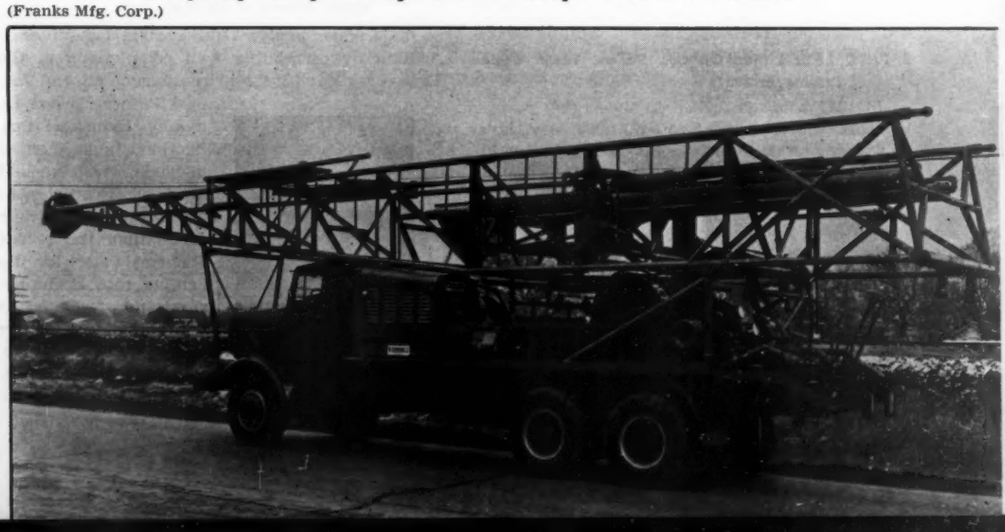
One of the Failing portable machines equipped with 28-foot derrick, and all mounted upon a Ford truck, was used for exploratory work in an area chiefly located in Lincolnshire County, England, and extending across the River Humber to include parts of southeastern Yorkshire, encompassing a total area of approximately 3,600 square miles.

This very complete survey required about 16 months and was started in January, 1936, and completed in April, 1937. The survey included the use of the torsional balance, with a total of about 1,250 observation stations. Local areas were worked with the seismograph, and to carry on this survey in one such area, 70 shot holes were drilled with this portable outfit and some 150 observations taken. In addition to the large amount of seismic work a magnetometer survey of selected parts of the area was also undertaken.

This work has been carried on by the D'Arcy Exploration Oil Co., and it is estimated not less than $1,500,000 has been spent on geological and geophysical surveys, drilling, and other exploratory activities. One test well was drilled but failed to find production.

Heavy-duty rotary drilling machine ready to move to location

(Franks Mfg. Corp.)



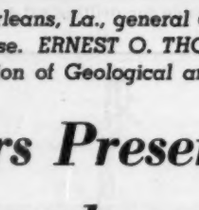
R. A. STEINMAYER, Tulane University, New Orleans, La., general convention chairman. GOVERNOR R. W. LECHE, Address of Welcome. R. D. REED, Los Angeles, Calif., Response. ERNEST O. THOMPSON, Texas Railroad Commission and chairman of Interstate Oil Compact Commission, "The Function of Geological and Engineering Science in the Conservation Movement"

Abstracts of Papers Presented Before The American Association of Petroleum Geologists, Paleontology and Mineralogy Division, and The Society of Exploration Geophysicists

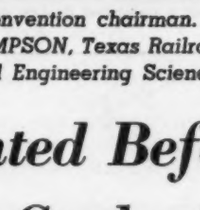
Roosevelt Hotel, New Orleans, March 15-18 Inclusive

WEDNESDAY, MARCH 16
MORNING SESSION

PRESIDING



H. B. Fuqua



H. V. Howe

1. H. B. FUQUA (Gulf Oil Corp., Fort Worth, Tex.): Presidential Address.

During the 1929-1932 depression the geological profession suffered greatly through loss of employment. An effort is made to point out various fields of cooperative endeavor wherein the geologist is well qualified to function and, through proper development of which, the profession should be enabled to avoid a repetition of the serious loss of employment which occurred at that time. The problems of the expert witness and of the professional appraiser are discussed briefly.

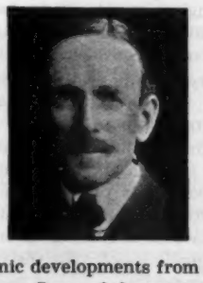
2. F. H. LAHEE (Sun Oil Co., Dallas, Tex.): Wildcat Drilling in 1937.

In 1937 wildcats drilled in the region covered by this report numbered 1,002 dry holes and 138 gas or oil discovery wells; that is, roughly 12 per cent of the wildcats were completed as producing wells. These and related statistics are discussed in connection with the reasons for locating the holes, and in reference to drilling costs.

3. J. E. POGUE (Chase National Bank, New York): Economic Aspects of Drilling.

This paper analyzes the normal incentives to drilling by correlating well completions in the United States with the price of crude oil, the Federal Reserve Board Index of Industrial Production, the production of crude petroleum, and crude oil discoveries. As a result of this multiple correlation, the recent abnormal rise in the drilling rate is emphasized and attributed to the entry of new factors largely related to the manner in which proration functions. A projection is then made of the drilling rate in Texas to 1942 and the per-well allowable estimated both for East Texas and the rest of the state, segregated into flowing and pumping units. The estimated daily production per flowing well for Texas, exclusive of the East Texas field, is estimated to be: 1936—51.3; 1937—52.1; 1938—40.4; 1939—36.6; 1940—33.2; 1941—32.7; and 1942—31.8. Finally it is shown how wider well-spacing and other measures for retarding the drilling impetus can not only correct this decline but even reverse the trend.

4. N. H. DARTON (U. S. Geological Survey, retired, Washington, D. C.): Tectonics of the Southwest.



In studies of the geology of Arizona, New Mexico, and western Texas during many years, information has been obtained on the structure and the history of structural developments. All of the great plateaus have been examined and the structure and formations of most of the very numerous detached ridges have been investigated. These stratigraphic and structural features are the products of many tectonic developments from Algonkian to Pleistocene time. Some of the most prominent mountains and plateaus, however, are remnants or centers of volcanic eruptions or have been caused by igneous intrusions. In the wide desert valleys between

the ridges the structure and succession are concealed by sand and gravel. Erosion, both recent and ancient, has removed formations from wide areas and effaced evidence of important structural features. Some of the great unconformities indicate long gaps in sedimentation, although to some extent formations may have been deposited and then removed by erosion. Many of the rocks contain evidences of the conditions of sedimentation which in most areas were determined by structural features, especially those limiting the areas of submergence.

The pre-Algonkian surface and evidence of post-Algonkian deformation so beautifully exhibited in the Grand Canyon are important elements of the earlier conditions and the widespread hiatus of Silurian and Devonian time is related to important uplift. The absence of later Mississippian deposits in much of the Southwest indicates a long period of emergence of large irregular areas, although possibly in some places sediments were laid down and removed by erosion in the time prior to the long period of Pennsylvanian and Permian deposition. The uplifts and deformation in early Mesozoic and at intervals in later Mesozoic time developed some of the larger outlines of the region, although the surface expression of these have since been greatly modified. The Tertiary history with uplift, faulting, and great volcanic outbursts accounts for many features now conspicuous topographically both as mountains and valleys and this activity continued far into the Quaternary in gradually decreasing amount. Certain rifts of relatively small amplitude have progressed through recent time and are at present subject to movement. Volcanic activity persisted well into the Quaternary in a few small areas.

5. GEORGE A. WILSON (College of Law, Tulane University, New Orleans, La.): Role of the Petroleum Geologist in the Development of the Law of Oil and Gas.

Legal concepts of mineral ownership and the nature of the property rights in oil and gas, including the theories of absolute ownership in place, qualified ownership, and so-called nonownership. Classification of the principal oil-producing states according to the theory of ownership prevailing in each.

The principal legal effects attributable to the different theories of ownership, including restrictions upon the creation and duration of estates in oil and gas separate from estates in the surface. The origin and operation of the lessee's obligation reasonably to develop the leased premises and to protect from drainage. Circumstances under which the lessee's rights may be terminated; liability for subsurface trespass. The new theories of development based on increased knowledge of geology, such as unitization and community operations. Importance of expert testimony by the geologists in the administration of these phases of the law.

Legal aspects of oil and gas conservation programs, including both the substantive laws and their actual administration. Validity of restrictions upon production and drilling operations is largely dependent on their reasonableness in light of geological information.

Legal rights and obligations incident to geophysical prospecting, selection leases, liability for trespass, et cetera.

6. F. B. PLUMMER (University of Texas, Bureau of Economic Geology Austin, Tex.): Oil Reservoirs.

This paper summarizes the main geologic factors which produce oil reservoirs, presents a new classification of oil reservoirs based on mode of origin, and contrasts the performance and characteristics of reservoirs of different origin. It evaluates critically the main physical chemical factors which influence and bring about the migration of oil and gas into the reservoir and determines the rate of yield of oil wells. It particularly emphasizes the part played by distance of travel of oil on rate of movement, the part played by size of hole on production, and the effect of water on oil movement through line-grained sand, especially in cases where interfacial tensions between oil and water and water and the sand are effective factors in fluid flow. Finally, the paper offers a new explanation of water coning in fine-grained reservoir sands and shows the effects of such cones on water-oil ratios and how the oil ratios may be increased.

AFTERNOON SESSION
PRESIDING

C. E. Dobbin

A. I. Levorsen

7. WARREN B. WEEKS (Phillips Petroleum Co., El Dorado, Ark.): South Arkansas Stratigraphy With Special Emphasis on the Older Coastal Plain Beds.

Deeper drilling and better well records in this area since 1934 have added much to the knowledge of subsurface stratigraphy in southern Arkansas.

Wells ranging in depth from 3,000 feet to 7,983 feet have disclosed 4,000 feet or more of sediments below the Travis Peak (Trinity) formation which are generally believed to be of Mesozoic age.

Approximately 1,800 feet of the Eocene series lies unconformably on the Gulf series. The underlying Comanche series of formations includes Fredericksburg, Paluxy, Glen Rose, and Travis Peak. This series, with an aggregate thickness of 4,600 feet in the southwest corner of the state, is completely absent within 85 miles due northeast, due to pre-Gulf truncation.

Also truncated at this time, were the underlying 2,250 feet of Cotton Valley formation variegated shales and sands; the 240 feet of Buckner red shale and anhydrite; the 870 feet of Smackover limestone; and the 1,800 feet of Eagle Mills red shale and salt formation. These lower beds are thought to be Mesozoic in age; however, the Eagle Mills may be older.

The underlying Paleozoic formations are steeply folded and are probably a part of the Ouachita Mountain system.

8. LLOYD W. STEPHENSON and JOHN B. REESIDE, JR. (Published by permission of the U. S. Geological Survey, Washington, D. C.): A Comparison of the Upper Cretaceous Deposits of the Gulf Region and the Western Interior Region.

Lithology: The gross sequence of Upper Cretaceous deposits in east-central Texas is like that in the Great Plains, but the sequence in the eastern Gulf region has no close counterpart in the interior and that in the Rocky Mountains has none in the Gulf region.

Lloyd W. Stephenson

Macrofauna: The gross sequences in the Gulf and interior regions are similar and permit a reasonably good correlation. Certain common genera and species are useful and likewise certain analogous forms. On the other hand, the faunal facies show some striking differences, particularly in the middle and later beds and particularly between the northern part of the interior region and the Gulf region. Similarities increase notably southward in the interior region. To some extent at least, the interior fauna appears to have been a boreal fauna that had connections across the Arctic with those of the Old World, whereas the Gulf faunas were more probably connected via the Atlantic.

Some of the more notable forms that occupy corresponding stratigraphic positions in the two regions are: Acanthoceratid ammonites *Epengonoceras* in the basal beds of the Eagle Ford shale and in the basal Graneros shale and equivalents; *Neocardioceras septemseriatim* (Cragin), *Metoiceras whitei Hyatt*, and *Inoceramus labiatus* Schlotheim in the middle beds of the Eagle Ford shale and in the Greenhorn limestone and equivalents; *Prionotropis woolgari* (Mantell) in higher beds of the Eagle Ford shale and in the lower part of the Carlile shale and equivalents; *Prionocyclus* and *Ostera lugubris* Conrad from the upper-most part of the Eagle Ford shale and the upper part of the Carlile shale and equivalents; *Inoceramus undulatoplicatus* Roemer above the middle of the Austin chalk and in the upper part of the Niobrara formation; *Mortoniceras ("Texanites")* of the *texanum* group in the upper part of the Austin chalk and in the upper part of the Niobrara formation; the crinoid *Marsupites* in the Tombigbee sand member of the Eutaw formation and in the Telegraph Creek formation; *Scaphites hippocrepis* (DeKay) in the upper part of the Austin chalk and the lower part of the Taylor marl and in the Eagle sandstone and equivalent; *Mortoniceras ("Texanites")* of the *delawarense* group in the lower part of the Taylor marl and in the uppermost part of the Mancos shale; *Placenticeras meeki* Boehm extending into the lower part of the Navarro group and the upper part of the Pierre shale; *Baculites grandis* Hall and Meek in the Nacatoch sand and in the uppermost part of the Pierre shale; the genus *Sphenodiscus*, common in the Corsicana marl and Kemp clay (uppermost part of Navarro group), less common in the Nacatoch sand, and widespread in the Fox Hills sandstone and equivalents.

Microfauna: Probably not well enough known in the interior region for more than a few comparisons.

9. C. C. CLARK, A. F. CRIDER, V. P. GRAGE, R. T. HAZZARD, E. B. HUTSON, H. R. KAMB, S. A. PACKARD, G. D. THOMAS, E. F. WARREN: Resume of Certain Cretaceous Fields of Louisiana (See abstracts 56-64).

10. B. W. BLANPIED and ROY T. HAZZARD (Gulf Refining Co., Shreveport, La.): Stratigraphic Relations of the Limestone Creek Group, Wayne County, Mississippi.

Certain limestone and marl beds outcropping in Wayne County, Mississippi, and the underlying

sands and betonitic clays have been removed from the Vicksburg group and renamed the Limestone Creek group. The Chickasawhay and Bucatunna formations make up the newly designated Limestone Creek group and are considered to be Miocene in age. The Chickasawhay limestones are correlated with the chert boulder beds of Alabama, Georgia and Florida, to which Cooke formerly had

B. W. Blanpied

Roy T. Hazzard

given the name of the Glendon formation of Vicksburg (Oligocene) age, but more recently has renamed the Flint River formation.

The Bucatunna formation, basal formation of the Limestone Creek group is made up of sands, clays and bentonitic clays, in part marine and in part estuarine. Detailed surface study reveals that the Bucatunna formation rests unconformably on different members of the Vicksburg group in Wayne, Jasper and Smith counties, Mississippi.

A study of the fauna of the Chickasawhay members by Howe, Israelsky, Alexander and others, shows that the microfauna is more closely related to the fauna of the Miocene beds of Florida than to the Oligocene beds of Mississippi and Alabama. The Chickasawhay formation is correlated with the Antigua formation of Antigua Island; with the Meson formation of the Tampico region Mexico, and with limestones exposed near Duncan Church, 7 miles southwest of Chipley, Washington County, Florida.

11. URBAN B. HUGHES (Laurel Oil & Gas Co., Laurel, Miss.): Detailed Study of Bucatunna-Vicksburg Contact in Smith County, Mississippi.

The Bucatunna formation is assigned to the lower part of the Limestone Creek group, basal Miocene. Bentonite deposits of the Bucatunna are discussed. The unconformable contact of the Bucatunna formation with the underlying Vicksburg formation has been mapped in detail from data obtained by numerous auger holes.

12. CHALMER J. ROY (Louisiana State University, Baton Rouge, La.): Type Locality of the Citronelle Formation, Citronelle, Alabama.

The type locality of the Citronelle formation, as established by Matson in 1916, is significant mainly because of the exposure of plant-bearing clays near Lambert's Station about 5 miles south of Citronelle, Ala. The flora from these clays was correlated with the Pliocene by Berry and thus seemed to date the sands and gravels so widespread in the Gulf Coastal Plains. Recent studies have shown that these clays are faulted and overlain unconformably by the sands of the so-called Citronelle formation. The structural evidence indicates that the clays are older than the sands so that the flora of the clays cannot be used to correlate the sands. A suggestion is made for the future use of the term Citronelle.

13. L. W. STEPHENSON and W. H. MONROE (U. S. Geological Survey, Washington, D. C.): Stratigraphy of the Upper Cretaceous Series in Mississippi and Alabama. Published by permission of the Director, Geological Survey.

The Upper Cretaceous sediments of the eastern Gulf region crop out in a crescentic band around the southwestern end of the plunging Appalachian Highlands in a belt 500 miles long and up to 75 miles wide. Their maximum thickness is estimated to be about 2,300 feet.

The Tuscaloosa formation is thickest in west-central Alabama, but thins northwestward to a feather edge in Tennessee, and thins toward the east to about 250 feet near Chattahoochee River. The Eutaw formation overlies the Tuscaloosa, from which it is separated by a major unconformity. The Eutaw thins both toward the northwest and toward the east, only the upper part being exposed in Tennessee and in Georgia. The Selma chalk overlies the Eutaw formation unconformably. It consists of nearly 900 feet of chalk in west-central Alabama, but is broken by a disconformity about 200 feet above its base, a few feet above a thin but persistent bed of hard pure limestone. Northwestward in Mississippi the lower third of the Selma passes by merging and intertonguing into the Coffee sand; the upper third merges into the Ripley formation; and the middle third continues into Tennessee as an impure chalk unit. In the eastern part of Alabama the part of the chalk below the bed of pure limestone merges into a unnamed sand, and the part above the limestone merges into and intertongues with sand that is called Ripley. The Selma and Ripley are separated from the overlying Prairie Bluff chalk by a major unconformity. The Prairie Bluff chalk merges toward the north in Mississippi into the Owl Creek formation and toward the east in Alabama into an unnamed marine sand and into a shallow-water sand formerly known as the Providence sand member of the Ripley formation.

The following zones have been traced through Mississippi and Alabama; the *Exogyra ponderosa* zone, which embraces the Tombigbee sand member of the Eutaw formation and the lower two-thirds of the Selma chalk and equivalent beds; the *Diploschiza cretacea* zone, a narrow zone in the Selma chalk, within and about 200 feet below the top of the *E. ponderosa* zone, traceable from Tupelo, Mississippi, to the longitude of Montgomery, Ala.; the *Exogyra costata* zone embracing the upper third of the Selma chalk, the Prairie Bluff chalk, and equivalent beds; the *Exogyra cancellata* zone, traceable throughout the area in the lower 200 feet or so of the *E. costata* zone.

Correlations with the Upper Cretaceous series of the western Gulf region are indicated.

The distribution of the chalks indicates deposition in clear, only moderately deep water, off the southwest end of the Appalachian Highlands during much of Upper Cretaceous time; drainage from the highlands was mainly southeast and northwest while the chalk was accumulating.

14. C. WYTHE COOKE (Washington, D. C.) and ARTHUR C. MUNYAN (Atlanta, Ga.): Stratigraphy of the Coastal Plain of Georgia. By permission of the U. S. Geological Survey and the Division of Mines, Mining, and Geology of Georgia.

The senior author has recently completed a revision of the stratigraphy of the Coastal Plain of Georgia, which, it is expected, will form part of a report on the geology of the state to be published by the Department of Natural Resources of Georgia. The accompanying map, scale 1/500,000, shows about 26 formations ranging in age from Upper Cretaceous (Tuscaloosa) to Recent. The overlap of successively younger formations toward the east is conspicuous. The major structural features to be inferred from the distribution of formations are a broad shallow basin centering off

C. Wythe Cooke

Arthur C. Munyan

the southern part of the coast and a flattening of the strata (probably without reversal of dip) in the western part of the state.

15. DONALD W. GRAVELL and MARCUS A. HANNA (Gulf Oil Corp., Houston, Tex.): Tertiary Zones of Correlation Through Mississippi, Alabama, and Florida.

The Tertiary zones the writers have found to be the most useful in subsurface correlation from the Mississippi River to Florida are discussed and

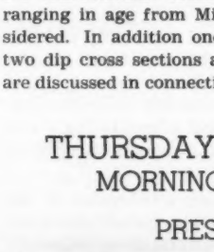
Donald W. Gravell

Marcus A. Hanna

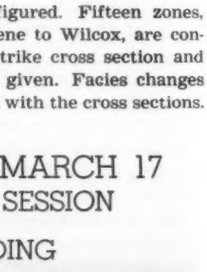
the characteristic fossils figured. Fifteen zones, ranging in age from Miocene to Wilcox, are considered. In addition one strike cross section and two dip cross sections are given. Facies changes are discussed in connection with the cross sections.

THURSDAY, MARCH 17
MORNING SESSION

PRESIDING



Donald C. Barton



J. C. Karcher

18. PAUL H. PRICE (State Geologist of West Virginia) and A. J. W. HEADLEE (Chemist, Morgantown, W. Va.): Regional Variations in the Composition of Natural Gas in the Appalachian Province.

A study of the composition of natural gas in the Appalachian Province shows it to have certain definite regional variations.

The amounts of the various chemical identities that are present and their areal distribution are shown: (1) in detail for the Elk-Poca and Campbell Creek Oriskany sand fields, Kanawha County, West Virginia; (2) in partial detail for the entire Big Injun sand production in West Virginia, and

(3) by a composite for all producing horizons in the Appalachian Province.

These regional variations are discussed in relation to structure, sedimentation, and regional metamorphism as indicated by carbon ratios based on coal.

Paul H. Price

A. J. W. Headlee

These regional variations in composition of natural gas offer criteria for prospecting for gas and oil, and indicate relative areal position of gas and oil in a given reservoir.

16. J. M. FROST, III (University of Texas, Austin, Tex.): Geologic Aspects of Heaving Shales on the Texas Coast.

From a study of several thousand wells in the Texas Coastal Plain it has been found that heaving shale occurs in trends or belts. In reaching this conclusion, all wells that reported heaving shale, all wells in South Texas deeper than 7,000 feet, all wells in the Gulf Coast below 8,000 feet, and all wildcat wells were considered. The trends found are based on five formations. The trends parallel the present shoreline of the Gulf of Mexico. The subsurface trends are nearly all the same width. Up-dip limits of each trend can be drawn but the down-dip limits are uncertain due to present drilling depths.

Heaving shale is usually found where there is a change in facies from shale to sand. It does not everywhere behave in the same manner because there are several kinds of heaving shale, each having its peculiar characteristics. The most treacherous of all heaving shale formations is the Jackson; however, in many places the Vicksburg heaves due to numerous lenses. For such formations, no entirely successful method of combating heaving shale has been devised. Heaving shale is more likely to occur on structures than off structures. Maps can be prepared that are helpful in evaluating prospects in heaving shale trends.

17. JOHN L. RICH (University of Cincinnati, Cincinnati, Ohio): Graben Faulting and Associated Phenomena.

If it is true that the earth has a brittle crust floating on a plastic subcrust, tension sufficient to cause a pulling apart of the crust should result in graben faulting, and the width of the grabens should be approximately twice the thickness of the brittle crust. The width of actual grabens seems to check reasonably well with this requirement.

Some years ago Taber pointed out why the mechanics of graben faulting causes the crust on the sides of the graben to tilt backward away from it. The same principle applies also to large normal faults. It may explain features like the "Granite Ridge" of Kansas.

The foregoing theory for grabens would lead to the expectation of negative gravity anomalies within grabens. Are they actually found?

19. T. V. MOORE (Humble Oil & Refining Co., Houston, Tex.): Behavior of Fluids in Oil Reservoirs.

20. FRANK G. MILLER and H. C. MILLER (U. S. Bureau of Mines, San Francisco, Calif.): Resume of Problems Relating to Edgewater Encroachment in Oil Sands. By permission of the Director, Bureau of Mines.

Petroleum technologists and progressive operators constantly are striving to increase the percentage of oil that may be recovered from reservoir rocks through wells. The exhaustive studies that have been made of the function of natural gas in the production of oil, for example, greatly have aided operators in increasing the quantity of oil recovered from reservoirs. Natural gas dissolved in and otherwise associated under pressure with oil in reservoir rocks, however, is not the only source of energy available for moving oil through sands to wells. In becoming "reservoir energy conscious" engineers have learned that in many petroleum reservoirs the edgewater flanking the oil accumulation constitutes a potential source of energy capable, through proper control, of increasing oil-recovery efficiencies materially. No longer is the encroachment of water into the oil and gas filled part of the reservoir considered as an evil to be combated by devious methods but rather a natural consequence, incident to the withdrawal of oil and gas from wells, that may be used advantageously in lengthening the flowing life of wells and increasing the economic recovery of oil and gas.

Little is known about the mechanism by which water operates in driving oil through reservoir rocks and there is a scarcity of published information on rates of movement of water which will result in maximum oil recoveries. Bureau of Mines engineers appreciate the deficiency of scientific knowledge on the best methods of applying the natural water drive to increase oil-recovery efficiencies and are initiating studies which they hope will contribute to the present small fund of information now available on the subject. This report is a synopsis or brief compilation of published data and thought accumulated so far, preliminary to laboratory experimentation and further research on the principles underlying the natural water drive as it affects oil recovery. The writers hope that the expansion of available information presented in the report will stimulate constructive thought and efforts leading toward more complete extraction of oil and gas from reservoirs.

22. W. ARMSTRONG PRICE (Corpus Christi, Tex.): Comparisons of Gulf Coast and Appalachian Geosynclines.

Similar total thickness, amounts of shallow-water sediments and progressively increasing deformation from the basin axis toward the bordering highlands are found.

The younger basin has gentle warping as against pronounced to overturned folding in the older, but slow deformation is going on in the former.

Continued basinward tilt and subsidence under sediment load in the Gulf Coast province might conceivably produce an accentuation of present up-warps finally to produce a folded highland zone, or the reverse of the conditions commonly supposed to have held in the formation of the Appalachian Basin.

In the older basin the mountains are generally believed to have determined the location of the foredeep and of the geosynclinal axis which formed in it as it became filled with sediments. In the younger basin, parallel shoreline trends have determined the axial position and no subsiding foredeep is in evidence.

Back of the whole process of the filling of the great interior ocean of North America may have been an original density excess under the ocean basin, the Gulf being the last remnant to be filled. Such a history would not, however, conflict with the mechanism now seen as active in the formation of the Gulf Coast geosyncline; namely, subsidence of areas of sedimentation under load balanced by uplift in the near-shore plains.

Comparison and difference between the coals, red beds and salt deposits of the two regions are noted. The occurrence of coarse sands and gravel over wide areas near the Gulf shoreline is compared with side distribution of Pennsylvanian conglomerate sandstones with no recognizable change in coarseness and a possible similarity in origin of the two is suggested.

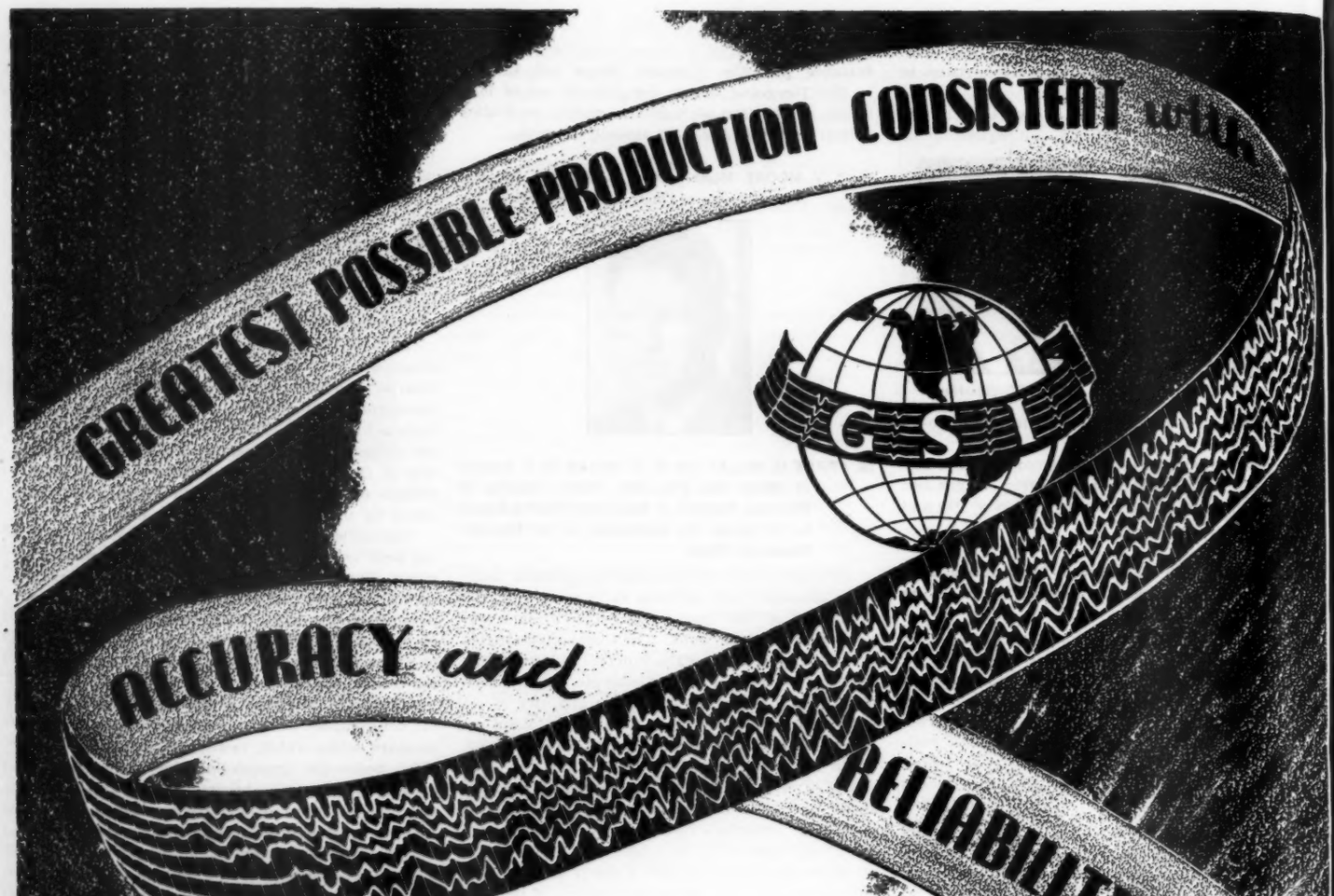
The Gulf Coast geosyncline may be asymmetrical, the continental limb being composed of a sedimentary series which, in subsiding, warped down older beds—the geosynclinal basement series—causing the latter to become involved in a geosynclinal structure which they antedate in age. It is not here inquired whether the southern limb contains a thick sedimentary prism genetically related to the geosyncline and derived from a foundered southern land mass. Salt-dome columns are intrusions into the upper geosynclinal beds evidencing their subsidence and probably derived from mother salt beds in the geosynclinal basement.

The scarp of the continental shelf resembles buried flexures found throughout the known part of the geosyncline.

21. JOHN S. IVY (Union Producing Co., Houston, Tex.): Rodessa Oil Field.

23. CARROLL E. COOK (Humble Oil & Refining Co., New Orleans, La.): Darrow Salt Dome, Ascension Parish, Louisiana.

The Darrow salt dome is on the east bank of the Mississippi River between Baton Rouge and New Orleans, being 30 miles southeast by road from the former city and 75 miles northwest from the latter. It was the first salt dome east of the Mississippi to develop sustained oil production in commercial quantities. The first producer was completed in March, 1933, and on December 31, 1937, the field had a daily production of 2,074 bbls. from eight wells, with a total



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production of 1,518,921 bbls. through that date. Proved acreage at the end of 1937 was about 40 acres, as determined by data from the 30 wells drilled, of which 11 produced oil in some quantity.

Production on the dome has been obtained from supercap sands which are probably Pliocene in age, and from flank sands of Miocene age. A small amount of oil was produced from the sands above the caprock, but the most important production has been secured from two flank horizons at approximately 5,700 feet and 7,000 feet, respectively.

The highest part of the dome is 4,627 feet below the surface, and at the 6,000-foot contour the salt mass is practically circular in plan with a diameter of 4,800 feet on present data.

The usual difficulties attendant on pioneer development of piercement-type domes have been experienced in operations at Darrow, among them being the problem of locating the very narrow productive zones, the faulting which has interrupted the peripheral continuity of these sands, and the lack of recognizable datum beds above the oil sands.

The deepest well on the dome was abandoned dry at 7,980 feet in shale of Vicksburg Oligocene age, this being the oldest geologic horizon reached on the structure to date.

24. J. C. KARCHER (Geophysical Service, Inc., Dallas, Tex.): Review of Relations Between Physics and Geology.

25. ALEXANDER DEUSSEN (Houston, Tex.): Discoveries.

AFTERNOON SESSION
PRESIDING

G. C. Gester

Harry H. Nowlan

26. PHILIP B. KING (U. S. Geological Survey, Washington, D. C.): Paleogeography and Correlation of West Texas Permian. Published by permission of the Director, Geological Survey.

This paper discusses the stratigraphy of the thick mass of rocks in western Texas which lie unconformably beneath the Mesozoic and which lie, in part with structural unconformity, on older Paleozoic rocks, including beds as high as the Pennsylvanian. The greater part of the mass is of Permian age, but whether the lower boundary of the Permian extends down to the unconformity just mentioned or is to be placed at a higher level depends on decisions based on continental and intercontinental correlations that are outside the scope of the paper. The mass of rocks is best preserved beneath the Llano Estacado, where it is, however, entirely concealed from view, and where knowledge of it is based on drilling. Westward, it extends at the surface across many of the mountain ranges of trans-Pecos Texas. Eastward, it comes to view in the Central Texas Paleozoic area.

One purpose of this paper is to summarize available evidence on the correlation of rocks exposed on the west with those exposed on the east, and to this end a correlation chart has been prepared. Correlation of the higher beds exposed on the west with those exposed on the east is now fairly well established, since they have been penetrated by thousands of wells in the intervening district. Subsurface records thus indicate that the Capitan is approximately the equivalent of the Whitehorse.

The relations of the beds next beneath the Capitan and Whitehorse have been much disputed, because the beds have not been penetrated in certain areas, because of complex changes in facies, and because of conflicting fossil evidence. It is suggested, however, that the Word and middle Delaware Mountain are approximately the equivalent of the Blaine. Still deeper beds of the section are only here and there penetrated by wells. They contain, however, more fossils than those higher in the section, some of which, notably the fusulinids are commonly recovered in cuttings, so that their correlation is rather well established. One of the deeper zones, that containing *Pseudoschwagerina*, lies close to the unconformity. Although the classification of this zone as to Pennsylvanian or Permian age remains in dispute, it is invaluable for local correlation purposes, and also, by its stratigraphic position, aids in the correlation of overlying beds that are of definite Permian age.

A set of five maps of the area shows the distribution of different lithologic facies, as well as changes in thickness of the units in successive stages of the Permian. The maps emphasize the persistence of structural features throughout the epoch, and their control of sedimentation. Limestone thus tended to be deposited in the positive areas during the early and middle parts of the epoch, and shales and sandstones in the negative areas. The units tend to be thicker in the negative areas and thinner in the positive areas. During parts of the epoch, however, one negative area, the Delaware Basin, was nearly encircled by barriers, so that the washing in of sediments was inhibited. Here, the thickness of beds laid down was abnormally small.

27. ADDISON YOUNG, MAX DAVID, and E. A. WAHLSTROM (Landreth Production Co., Fort Worth, Tex.): Geology of the Goldsmith Pool, Texas.

Although discovered in 1934, the Goldsmith pool is still in a relatively early development stage. The present proved area has a length of about 12 miles and a maximum width of more than 4 miles. Its producing limits have been established at relatively few points around this large pool. Geologically, it is located on the Central Basin platform, several miles west of the eastern rim.

E. A. Wahlstrom

The principal reservoir is a porous dolomite which occurs 400 feet below the top of the main Permian dolomite series of Ector County. The top of the reservoir is filled with gas, occurring in at least two large, distinct gas caps. Below the gas, oil fills a vertical space of 60-100 feet and rests on sulfur water. The bottom water table is an undulating surface.

The porous zone occurs immediately below a distinct unconformity. The development of this porosity is believed to be due to the relatively elevated position of this reservoir dolomite during the time interval preceding deposition of the overlying sand and dolomite beds.

The Goldsmith structure is a large compounded feature which does not conform to any standard pattern. Broadly viewed, it is a large dolomite bank or reef which has been warped by subsequent, genuine, structural movements.

28. C. E. DOBBIN (U. S. Geological Survey, Denver, Colo.): Geologic Structure of Part of Petroleum Reserve No. 7, Washington County, Utah. By permission of the Director, U. S. Geological Survey.

The structural history, geologic structure, and results of deep drilling in an area occupying a structural transition zone between the High Plateaus of Utah and the Basin and Range Province are described. Cambrian quartzite rests unconformably on pre-Cambrian igneous rocks, and is overlain by about 18,500 feet of Paleozoic and Mesozoic strata which record frequent oscillations but no orogenic movements prior to the late Cretaceous or early Tertiary (Laramide revolution). Thrust faults of different ages in the Beaver Dam Mountains and subsequent normal faults east therefrom indicate continual post-Laramide crustal disturbances down to rather recent time. Major north-trending normal faults, with the downthrow usually on the west, divide the area into east-dipping monoclinal blocks. The normal faults are both straight and curved, terminate abruptly, vary in vertical displacement along any one fault surface, and have as much as 4,500 feet of observable stratigraphic displacement.

Encouraged by the finding of oil in the small Virgin field just to the east and by the presence of anticlinal structure, six deep wells have been drilled in the area described without discovering commercial quantities of oil or gas.

29. HAL P. BYBEE (Bureau of Economic Geology, Austin, Tex.): Possible Nature of Some Limestone Reservoirs in the South Permian Basin.

In this short discussion, the Carlsbad Caverns is treated as a sub-surface reservoir filled with petroleum and natural gas. The chief points of interest are that the cavern would hold only one-half the petroleum already produced by the Hendricks field in Winkler County, that in pursuing a standard 330-660-foot development program only four holes would directly penetrate rooms of the cavern, and finally that many of the limestone reservoirs in the south end of the Permian Basin are in reef-life deposits similar to the Capitan formation in which the Carlsbad Caverns occur.

It is quite possible that the reservoirs in the area contain many spaces filled with oil, rather than normal porosity induced by the change from limestone to dolomite or the natural voids of regular sedimentation.

30. F. B. PLUMMER (University of Texas, Austin, Tex.) and R. C. MOORE (University of Kansas, Lawrence, Kans.): Stratigraphy and Structure of the Older Carboniferous Rocks on the Llano Uplift in Central Texas.

This paper summarizes the results of recent detailed work in the faulted area on the west side of the Llano uplift in Texas. It presents the geologic section of the Mississippian and Pennsylvanian strata, describes in some detail the little-known Chappel formation of Lower Mississippian age, and illustrates the more important elements in its fauna. It presents a new zonation of the Barnett formation and attempts a more exact correlation of the divisions of the Barnett with the strata of Chester age in Oklahoma, Arkansas and Illinois. The faunal zones of the Marble Falls and Smithwick are also pointed out, and correlation of these zones mentioned. The structure of the rocks is presented by means of detailed cross sections, maps, and photographs. Details of the structure of the down-faulted blocks of limestone west of Mason and Brady and the great flexure east of London are presented by diagrams and photographs for the first time.

32. CLARK MILLISON (Tulsa): Subsurface Study of the North Flank of the Wichita Mountains, Oklahoma.

Driller's logs, samples, magnetometer and surface data have been used to determine the stratigraphy and principal structural features of the north flank of the present outcrop of the Wichita

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Don't let them get away with it

The Chemical Cop is U.O.P. Inhibitor No 1 and the Universal organization backs him up—protects him

Universal specialists spy out these enemies and knock them out by proper sweetening and treating methods before they get a chance at the cop He couldn't do his job without this protection

The Chemical Cop will work for any refiner

But it is better to be a Dubbs refiner and get the full benefit of Universal's inhibitor service—to say nothing of the benefits of Dubbscracking

The Chemical Sergeant is always on call for jobs that are too tough for the cop The Sergeant is U. O. P. Inhibitor No 4

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Mountains. Study of the stratigraphy has been principally from sample analysis of cuttings from wells because only 662 feet of the more than 2,600 feet of Simpson, Viola, Sylvan, and Hunton formations crop out in the mountains. A subsurface structure map contoured on top of the Wellington formation is presented. One interpretation is shown of the geologic outcrops of early Paleozoic beds below the Upper Pennsylvanian-Lower Permian unconformity but lack of data prevents an accurate and permanent interpretation.

The presence of high-gravity oil and gas at shallow depths, adequate reservoir beds, and sufficient structure for traps suggests this area as a promising province for petroleum reserves.

31. ROBERT H. CUYLER (University of Texas, Austin, Tex.): Travis Peak Formation of Central Texas.

The Travis Peak formation in Central Texas consists of the basal Cretaceous sediments. As its type locality in northwestern Travis County the 260-foot section is divided into the Sycamore, Cow Creek, and Hensell members. The formation thins north and west and thickens south and east from the type locality. The Sycamore, the basalmost member consists of conglomerate, sandstones, and shales. The Cow Creek member is composed of fossiliferous limestones. The Hensell member is made up largely of sands, arenaceous limestones, and arenaceous shales. The varied nature of sediments in different members causes members to change rapidly in thickness in different localities. In a distance of 60 miles along the dip of the formation, the Travis Peak varies from less than 50 to approximately 600 feet, the thickening taking place down-dip. The Travis Peak-Glen Rose contact varies in nature, being marked by conglomerates in some areas and by coarse sandstones in others. Some zones in the Travis Peak are very fossiliferous; the faunal assemblages have a typical Aptian aspect.

33. E. J. BARTOSH (Bankline Oil Co., Los Angeles, Calif.): Wilmington Oil Field, California.

The Wilmington oil field, 20 miles due south of Los Angeles, and adjacent to the Los Angeles harbor, is one of the largest oil fields discovered in California.

Oil was first produced in January, 1932, from the Lower Pliocene formation. The General Petroleum Corp. No. 1 Terminal was the first large well and was completed in December, 1936, with an initial production of 1,500 bbls. per day, 20.5 degrees A.P.I. gravity, from the Puente formation (Upper Miocene) at a depth of 3,625 feet.

Discovery was made by correlation of outpost wells together with a seismograph survey which added materially to the general outline of structure.

The structure is an irregular shaped dome with faulting transverse to the principal axial trend. The dip of strata ranges from 2 to 15 degrees.

The major faulting apparently occurred near the close of Miocene time and continued progressively throughout deposition of Repetto formation (Lower Pliocene).

Production is obtained from the Repetto formation (Lower Pliocene) and Puente formation (Upper Miocene).

There are five producing zones: Tar, Ranger, Terminal, Lower Terminal, and Ford.

The gravity of oil ranges from 12 to 31 degrees A.P.I. The lower 700-800 feet of Pliocene and 2,500 feet of Miocene formation contain oil and gas at different stratigraphic levels.

The field has produced a total of 14,180,130 bbls. of crude oil from discovery date, December 7, 1936, to December 31, 1937, inclusive.

Recent development in the city of Long Beach has increased the proved area from 2,100 acres to 3,200 acres.

Current production is 74,019 bbls. daily from 348 wells with a large part of proved area undeveloped.

34. J. R. LOCKETT (Ohio Fuel Gas Co., Columbus, Ohio): Structural Significance of the Cincinnati Arch.

An area including Ohio, Indiana, the southern pensinsula of Michigan, and parts of Illinois and Kentucky is considered as an independent structure province, the diastrophic history of which has been little influenced by orogenic movement in the Appalachian area. The southern boundary of the area is the succession of anticlinal trends connecting the Ozark uplift with the Appalachian.

The dominant structural feature is the northern development of the Cincinnati arch which branches in southwestern Ohio, one lobe crossing Indiana in the direction of Chicago and the other crossing western Ohio in the general direction of Toledo. These two anticlinal trends have remained positive since Ordovician time. Three major negative areas have developed by the subsidence of the Michigan Basin, the Appalachian geosyncline, and the Illinois Basin.

The structure of the Cincinnati arch has had very little influence on the accumulation of oil and gas. Minor folds which have been formed within the basin areas have controlled accumulation in all producing horizons except the Clinton and Trenton.

The trends of fault systems and minor folds roughly parallel either lobe of the Cincinnati arch. Possible reasons for this relation are discussed.

35. KENDALL E. BORN (Assistant Geologist, Tennessee Division of Geology, Nashville, Tenn.): A Lower Ordovician Sand Horizon ("St. Peter") in Middle Tennessee. By permission of the State Geologist.

A number of the deeper wells in the Central Basin and Highland Rim areas of Tennessee have penetrated a sandy horizon in the Lower Ordovician at depths ranging from 1,250 to 1,600 feet below the top of the Chattanooga shale and approximately 850 feet below the base of the Trenton limestones. This zone, which averages less than 10 feet in thickness, is composed of well rounded, glassy and frosted quartz grains in a matrix of white-to-gray, granular, magnesian limestone. This unit has been correlated by some geologists with the St. Peter sandstone of the Mississippi Valley region.

The lithologic character, distribution, and variations of the "St. Peter" zone in Tennessee are discussed, especially as they relate to oil and gas possibilities. A tentative correlation in the light of new data is presented.

FRIDAY, MARCH 18
MORNING SESSION
PRESIDING

R. D. Reed

Alexander Deussen

36. ALFRED H. BELL (Geologist and Head, Oil and Gas Division, Illinois State Geological Survey, Urbana. Published with the permission of the Chief, Illinois State Geological Survey): Recent Petroleum Development in Illinois.

During the past year new drilling in Illinois, especially in the deeper part of the Illinois Basin, has been providing a wealth of new information on the subsurface geology of the region. Oil has been discovered in numerous widely scattered localities in the basin, but as yet the boundaries of the productive areas are largely undefined. Since May 1937, approximately 4,000,000 bbls. of oil has been produced from the new fields and present indications are that reserves in the new areas will exceed 100,000,000 bbls. The producing strata and the structures controlling the accumulations are discussed.

37. E. A. NEWMAN (Michigan Geological Survey, Lansing, Mich.): Recent Developments in the Michigan Basin.

New oil and gas fields have been discovered in the Southern Peninsula of Michigan, ranging from the southwest part of the Saginaw Bay area. Recent discoveries have been made in Arenac, Gladwin, Midland, and Allegan counties. The older pools lie in the intervening area.

The most prolific production thus far has been confined to the central and deeper portions of the basin, but interest in possible shallower fields has been renewed with the finding of the Salem field in Allegan County. Oil is produced from the Traverse and Dundee limestones of Upper and Middle Devonian age, the Dundee being the principal producing horizon. Tests to explore the possibilities of Silurian and Ordovician formations are receiving added impetus.

38. RYCROFT G. MOSS (Phillips Petroleum Co., Wichita, Kans.): Developments in Kansas, 1937.

There were 69 new pools and new producing horizons in old pools discovered in Kansas in the year 1937. Three of this number are gas discoveries and 66 are oil discoveries. The most important producing horizons are the Lansing-Kansas City lime and the Arbuckle dolomite which furnished two-thirds of the new discoveries. Barton, Ellis, Rice, and Russell counties, on the Central Kansas uplift, accounted for half of the new pools and 80 per cent of the estimated reserves found during the year.

The first important Misener (basal Mississippian) sand production in Kansas was found with the discovery of the Zenith pool in southeastern Stafford County.

Deep wildcat wells in far western Kansas in

Hamilton, Ford, Logan, and Wallace counties and in southern Nebraska in Jefferson and Richardson counties furnished important stratigraphic data.

Geological exploration during the year consisted of seismograph, core drilling and some surface structure mapping.

39. EDWIN H. HUNT (Texas Co., Denver, Colo.): Rocky Mountain Area.

40. HAL P. BYBEE and BERTE R. HAIGH (Bureau of Economic Geology, Austin, Tex.): Summary of Petroleum Development in West Texas and Southwestern New Mexico During 1937.

There was a total of 667 wells drilled in southeastern New Mexico of which 49 were dry holes, 20 gas wells, and 598 oil producers. In West Texas there were 2,604 wells completed, of which 216 were dry holes, 8 were gas wells and 2,380 were oil wells. For the area there were a total of 3,271 wells completed of which 28 were gas wells and 265 dry holes, the balance of 2,978 being producers. Thus there was an increase of more than 60 per cent in development in 1937 over 1936. Many minor details and some rather pertinent geological data were furnished by 10 or 12 completed wildcat wells.

Berte E. Haigh

41. HAROLD W. HOOTS (Richfield Oil Corp., Los Angeles, Calif.): Discoveries in California During 1937.

42. H. K. SHEARER (Hunter Co., Shreveport, La.): Oil and Gas Development in South Arkansas and North Louisiana in 1937.

South Arkansas. Oil production in South Arkansas in 1937 amounted to 12,187,595 bbls., an increase of 1,532,655 bbls. or 14.4 per cent over 1936. This was the first increase since 1925, when the deeper sands at Smackover were developed.

High points of 1937 were: (1) Discovery of the 5,500-foot sand at Shuler in western Union County in April and later development of production in the Jones sand and Smackover lime at 7,500-7,600 feet; (2) extension of the Rodessa producing area from Louisiana into southern Miller County in June, with production from the Gloyd lime and Mitchell sand at 6,050-6,100 feet; (3) discovery of the Buckner field in northwestern Columbia County in December, producing from the Smackover lime at 7,200 feet.

Completions totaled 175, with 108 oil wells, 5 gas wells, and 62 dry holes, an increase of more than 100 per cent over 1936. Of the dry holes, 52 are classed as wildcats. The Rodessa extension had 59 oil and 4 gas wells, and Shuler had 22 oil wells, of which 3 were first completed in the 5,500-6,000-foot zone and later deepened and recompleted in the Jones sand or Smackover lime.

No proration regulations were in force in Arkansas in 1937.

With the Shuler and Buckner fields to be developed, and the expected search for other similar fields, there should be a considerable increase in drilling in 1938.

North Louisiana. North Louisiana oil production in 1937 was 28,668,070 bbls., an increase of 1,896,925 bbls. or 7.1 per cent over 1936, as against an increase of 178 per cent from 1935 to 1936.

Chief interest lay in development rather than in new discoveries. The only real discoveries were two deep gas and distillate fields: Bear Creek in Bienville Parish, and Ruston (Causey) in Lincoln Parish. At Bear Creek, production has been found in both the basal Glen Rose at 6,700 feet and the Travis Peak at 7,879 feet. At Ruston the only well was completed in the basal Glen Rose at 5,320 feet.

First producers were also completed in the basal Glen Rose at Lake Bistineau, Bienville Parish, and in the Lower Marine formation at Cotton Valley, Webster Parish, although these zones had already been tested and found capable of producing in 1936. At Cotton Valley, 29 gas and distillate wells were completed in the Bodcaw sand at an average depth of 8,300 feet. The productive area in this deep sand is much larger than in the shallower formations, and saturation is known to extend more than 500 feet down-dip from the top of the structure. No wells were completed in 1937 in the 5,500-foot or Holloway sand, which is lenticular in distribution.

The Lisbon field in Claiborne and Lincoln parishes was the most active area, and 155 oil wells were completed in addition to the discovery well, completed late in 1936. The field is still undefined, as the only dry hole was junked without testing.

Drilling activity at Rodessa moved into the Texas and Arkansas extensions, but 90 oil and 17 gas wells were completed in Louisiana, and the field was extended northwest by Gloyd and Mitchell sand production. Total oil production declined a little from 1936, due to proration, which was in force throughout 1937.

Oil was discovered in the basal Glen Rose or 5,700-foot zone at Sugar Creek, Claiborne Parish, but only 3 of 10 wells drilled to that depth produced oil, the rest being gas wells. Development of the Pettit zone or basal Glen Rose, continued at Sligo, Bossier Parish, with 6 oil and 9 gas wells completed.

There were 716 completions reported in North Louisiana, of which 411 were oil wells, 175 gas wells, and 130 dry holes. It is worth noting that 93 oil wells were completed in the old shallow Caddo field, and 87 gas wells in the Monroe field. Of the dry holes, 65 were in wildcat territory.

The deepest test ever drilled in North Louisiana was completed at Rodessa, in rock salt at 11,486 feet. Three other tests between 9,000 and 10,000 feet deep were drilled, two in Caddo Parish and one in the Richland Parish gas field. All were abandoned in the Lower Marine beds.

The number of wells to be drilled will probably decline somewhat in 1938, unless discoveries are made early in the year, but most of the wells drilled will be very deep.

43. E. A. WENDLANDT (Humble Oil & Refining Co., Tyler, Tex.) and C. L. HEROLD (Shell Petroleum Corp., Tyler, Tex.): Resume of Development During 1937 in the East Texas District.

44. O. L. BRACE (Houston, Tex.): Gulf Coastal Developments in 1937.

The Gulf Coast districts of Texas and Louisiana had their most successful year during 1937, both from the standpoint of the number of new fields and in the apparent total of reserves represented by these discoveries. The 29 new productive areas are about equally divided between the two states, but it is probable that Louisiana can claim considerably more than half of the new reserves represented.

As in previous years, most of the discoveries lie in the deep Coastal zone, with but three new fields located in the updip intermediate and Jackson zones.

Two new areas of unusual interest are the Spurger field in Tyler County, Texas, and Ville Platte in Evangeline Parish, Louisiana. Each of these is producing from horizons older than Yegua and proves, for the first time, the presence of commercial oil from these older beds on the Gulf Coast proper.

Both flank development and deeper drilling have been an important factor in areas of proved production. The current belief in the potentiality of the lower, unexplored section has been further justified during the past year.

45. STUART MOSSOM (Magnolia Petroleum Co., San Antonio, Tex.): 1937 Activities in South Texas.

Thirty-nine new producing areas have been opened in South Texas since March, 1936, and 76 additional sands in already proved areas have been found. Many of the new areas are small and others too recently discovered to evaluate definitely. The producing formation of most new fields has been the Frio with the Jackson second in rank. In additional sands the Frio is again the formation of most discoveries.

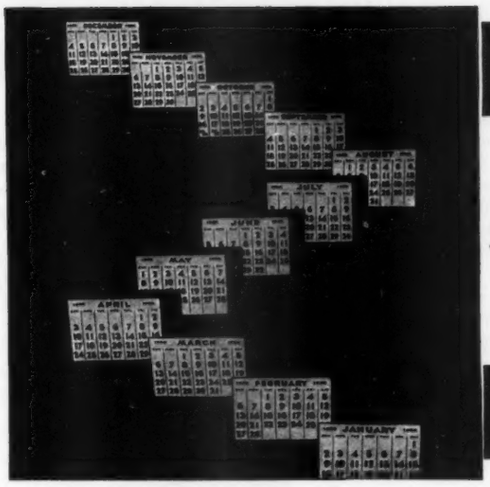
The Benavides or North Sweden field of central Duval is the most important field found and developed this year. It covers approximately 3,500 acres and at the present time is producing from eight different horizons in the Frio, Jackson, and Cockfield. In the Pettus area, South Burnell is an important discovery. New typical Laredo fields are Oilton-Killam in Webb County and Ezzell in McMullen County. In the coastal area, Luby and West Saxet in Nueces County, East Premont in Jim Wells County, and North McFaddin in Victoria County are important discoveries.

46. BASIL B. ZAVOICO (Chase National Bank, Houston, Tex.): Russian Developments in 1937.

AFTERNOON SESSION
PRESIDING

W. B. Heroy

Frank A. Morgan



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47. F. W. DeWOLF (Professor of Geology, University of Illinois, Urbana) and W. W. WEST (Skelly Oil Co., Midland, Tex., formerly with Montana-Dakota Utilities Co., Baker, Mont.): Stratigraphic Studies of the Baker-Glendive Anticline, Eastern Montana.

The NP No. 1 well drilled by rotary in 1935-36 by the Montana-Dakota Utilities Co. to 8,186 feet on the Baker-Glendive anticline of eastern Montana, following geophysical exploration of the subsurface, revealed that strata above the Pennsylvanian are similar to those of the Black Hills section. However, between the top of the Minnelusa at 5,631 feet and the top of the Madison at 7,440 feet there are present 1,060-1,260 feet of beds representing the Big Snowy group of central Montana, as described in 1935 by H. W. Scott. The Madison appears to extend to about 8,055 feet, and the strata below that depth may represent the Devonian. Considerable help with correlations was offered by a restudy of samples from the Prairie Westphal well drilled in 1931 on the Porcupine dome, 135 miles northwest of the NP well.

New discoveries include 350 feet of salt in the Spearfish formation; and the eastward continuation of the Big Snowy geosyncline to give a length of at least 375 miles. Conventional paleogeographic maps of several periods need modification as a result of these explorations which were located near the supposed margin of the interior seas existing from time to time. Indentification of the Big Snowy group is based largely on fossils and is considered reliable in spite of a marked difference in lithologic character of the sediments.

The NP No. 1 well flowed oil and a little water from 6,796 feet but water increased after acidizing. Deeper drilling showed oil at many lower horizons down to and including the bottom of the well. Since completion the well has been pumped to the capacity of storage, except in the most unfavorable weather, but the production is not large.

48. W. T. NIGHTINGALE (Mountain Fuel Supply Co., Rock Springs, Wyo.): Petroleum and Natural Gas in Non-marine Sediments of the Powder Wash Field in Northwest Colorado.

The occurrence of considerable volumes of petroleum (1,000 bbls. per day) and natural gas (34,000,000 cubic feet per day) in non-marine sediments of the Powder Wash field in northwest Colorado has recently attracted much attention. The petroleum and natural gas production occurs in continental deposits of Lower Eocene age known as the Wasatch formation. Production is believed to be indigenous to the non-marine Wasatch formation and not migratory from either underlying or overlying formations. Saline waters occur in association with the petroleum producing zones. Accumulation apparently is controlled by an upfolded Tertiary dome structure but within the confines of the structure producing horizons are extremely irregular. This irregularity is largely due to the highly lenticular sand bodies which are characteristic of the continental Wasatch formation.

The Powder Wash field is discussed as an example of a field productive of both petroleum and natural gas from non-marine sediments. The stratigraphy of the region and general structural conditions are described in some detail to prove as untenable any assumption of vertical migratory movement of hydrocarbons from other formations. Lateral migration is shown as being equally unsupportable. The extra hazards involved in developing such fields in the Wasatch continental formation are discussed.

49. W. D. ANDERSON and JAMES R. DAY (Amerada Petroleum Corp., Midland, Tex.): Monument Field, Lea County, New Mexico.

The Monument field is in east-central Lea County, southeastern New Mexico, and at present represents the northernmost producing area of the Hendricks - Jal - Cooper-Eunice trend of Winkler County, Texas, and Lea County, New Mexico. Regionally the structure is closely related to this same trend but is locally developed as a broad anticlinal fold in contrast to the rather narrow anticlinal ridges at the south. Production is from porous dolomitic limestone of Middle Permian age and is found at an average depth of 3,950 feet. A horizontal oil zone common to the field and approximately 150 feet in thickness is found between the subsea depths of minus 200 feet and a common water table of minus 350 feet. Since the oil zone is horizontal and there is considerable structural relief, production is found through a stratigraphic range of several hundred feet. A definite relationship exists between structural position and productivity. Productive limits are defined off structure by the absence of porosity above the water table. Folding occurred at intervals during Middle and Upper Permian time, but the major movement was post-salt in age. Prior to January 1, 1938, a total of 453 wells, each on a 40-acre unit, had been drilled and since the field was discovered early in 1935 had produced, under proration, 14,875,531 bbls. of oil.

James R. Day

50. RALPH E. TAYLOR (Freeport Sulphur Co., New Orleans, La.): Salt-Dome Terminology.

A survey of the literature pertaining to salt domes of the Gulf Coast reveals that the terminology used is in a considerable state of confusion. This confusion has resulted from a lack of definition, duplication of terms, and inconsistent usage. A list of the more common terms is presented, accompanied by brief discussions of the manner in which these terms have been used. This list emphasizes the desirability of a clarification of the terminology. It is suggested that the terminology be restricted by elimination of duplicate and overlapping terms, and certain restrictions are proposed.

51. H. B. STENZEL (Bureau of Economic Geology, Austin, Tex.): The Yegua Problem.

The Yegua problem consists of two separate parts, a factual part covering the relation of the so-called Yegua to adjacent formations and a nomenclatorial part covering the question which name should be applied to the so-called Yegua. The relations of the Legua to the underlying Crockett in east and central Texas are discussed in detail and the position of the type localities of Yegua, Cook Mountain, and Crockett are given. The boundary between the Crockett and Yegua is revised to fit lithologic and paleontologic evidence. The so-called marine Cockfield of micropaleontologists and subsurface geologists is shown to be separated from the true Cockfield of Vaughan by one of the largest disconformities of the Coastal Plain. The zone of *Nonionella cockfieldensis* is shown to be a part of the transgressive Jackson.

Nomenclatorially the name Yegua is an unfortunate choice, because it has no priority and its type locality is in the lower half of the Crockett. The name Lufkin of Kennedy was proposed half a year before the Yegua of Dumble. The type locality of the Lufkin is acceptable. In defining the Yegua Dumble use Kennedy's definition of the Lufkin word for word.

52. HENRY N. TOLER (Mississippi State Oil and Gas Supervisor, Jackson, Miss.) and WATSON H. MONROE (U. S. Geological Survey, Washington, D. C.): Jackson Gas Field and the State Deep Test Well.

The Jackson gas field, which was discovered February 28, 1930, in and around the city of Jackson, Hinds and Rankin counties, Mississippi. The Jackson structure was first mentioned in 1860 by Eugene W. Hilgard in his "Geology and Agriculture of Mississippi." Two wells were drilled on the edge of the field in 1917 and no additional drilling was carried on until 1928 and 1929.

Henry N. Toler

One hundred ninety-five wells have been drilled on the structure, of which 137 produced gas, 3 produced oil, and 55 were dry. To the end of 1937, a total of 72,340,829,000 feet of gas and 15,000-20,000 bbls. of oil have been produced. Ninety gas wells were producing at the end of 1937.

The producing formation is the top of the Selma chalk, which is encountered at a depth of 2,060-2,230 feet below sea-level.

The uplift has been caused by a relatively upward movement during and after the intrusion of an igneous plug. A number of wells drilled have encountered igneous rock at approximately 3,000 feet and deeper.

The deepest test drilled in the field was the state of Mississippi's fee well No. 2, drilled to 5,530 feet. This well penetrated red and gray shale, sandstone, gray quartzite, and several bodies of igneous rock. The formations below 3,200-3,400 feet appear to be of Lower Cretaceous (Trinity) age.

This structure is the result of igneous activity and great vertical movement that affected a large area. Because of its extent and of the fact that the structural and the stratigraphic conditions below the chalk are very complex, it is hazardous to predict what the results of future exploration will be.

53. D. J. MUNROE (Sun Oil Co., Hattiesburg, Miss.): Scanlan, or Midway, Salt Dome, in Lamar County, Mississippi.

The Scanlan, or Midway, dome is 14 miles south of west of Hattiesburg, in Lamar County, Mississippi. The approximate center of the dome is in section 28-4n-15w. It is 110 miles northeast of the Sorrento dome in Ascension Parish, Louisiana, the closest producing coastal salt dome. The only other salt dome discovered to date in Mississippi is 96 miles northwest of the Midway dome, in western Hinds County.

Early interest in the area resulted from subsurface correlation between widely separated dry holes. Core drilling and test wells have revealed a domed structure elongate northeast and southwest with several hundred feet of closure. Several wells have found anhydrite and salt. The present test is below 7,900 feet.

The Midway dome is a geological prospect. The stratigraphic section of the Eocene does not differ much from that normal for the area unless it is in the scarcity of sand bodies of any consequence.

(Continued on Page 62)

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Structurally this is a piercement-type dome, belonging, in the writer's opinion, in the inland rather than coastal classification. Salt movement had its maximum development in late Tuscaloosa or pre-Eutaw time, but continued until late Oligocene time. The oil accumulation that resulted in the asphaltic sand took place prior to the close of Tuscaloosa time.

The two most important facts brought out by the Midway dome are (1) the definite establishment of a salt dome basin in central Mississippi, and (2) through the finding of 152 feet of asphaltic sand, the proof of the former presence of source beds of sufficient extent to yield oil in large quantities. Whether the Midway dome will eventually be found to be commercially productive only future drilling can reveal.

54. PHIL F. MARTYN (Houston Oil Co., Houston, Tex.): Refugio Oil and Gas Field, Refugio County, Texas.

The Refugio field was discovered in 1919 and has been subjected to sporadic and intermittent development since that time. Subsequent to the discovery of oil in July, 1928, the field has become one of the most important oil fields of the southwestern Gulf Coast Texas area. Total oil production has been approximately 35,000,000 bbls. Oil and gas is produced from 10 separate sand reservoirs and more than a dozen sands below a depth of 1,600 feet have yielded gas only, but in commercial quantities. Currently the field is producing 4,500 bbls. of oil and approximately 45,000,000 cubic feet of gas daily from 185 wells.

Geologically, the field presents an interesting problem because of recurrent structural uplift in different areas during the deposition of different stratigraphic intervals. Oil production has proved that the accumulation is not concentric with the latest structural movement in the area but is retained, in some cases, in early structures which have been only partly deformed by later movements. In other places, it appears that there has been one or more lateral migrations of the trapped oil and the present producing area is not the original accumulating or structural area. These migrations are shown to be the result of subsequent deformation and tilting of the early structural folding.

PAPERS READ BY TITLE

55. MERLE C. ISRAELSKY (Union Producing Co., Houston, Tex.): Cretaceous and Late Comanche Stratigraphy of the Arkansas-Louisiana-East Texas Area.

56. C. C. CLARK (Union Producing Co., Shreveport, La.): Sugar Creek Field, Louisiana. Written with the permission and under the direction of John S. Ivy.

The Sugar Creek field, discovered in March, 1930, in northwest Louisiana, has a present producing area of about 4,000 acres.

The structure of the field is an elongate dome extending north by northeast through the center of section 6-19n-5w. The Comanche structure conforms closely with that of the Upper Cretaceous, although the dips on the beds of the former are about 100-160 feet per mile and those of the latter are 60 feet per mile. Sharper dips are found on the west, south, and southeast flanks of the structure but flatten northeast. This dome is largely the result of deformation at the close of the Comanche and during the late Eocene period.

Gas production is obtained from two separate reservoir zones, known as the Kilpatrick (4,300-foot) and the Darrett (5,700-foot) horizons, the latter also producing oil. The Kilpatrick gas horizon, in the lowermost part of the Glen Rose anhydrite zone, consists of porous oolitic limestone. The Darrett horizon was discovered in May, 1936. It consists of fossiliferous and oolitic limestone, red and gray sands, shales, and siltstones found in the transition zone at the base of the Lower Glen Rose and in the top of the Travis Peak.

Eleven gas wells have been completed in the Kilpatrick horizon, which had produced approximately 28,000,000,000 cubic feet of gas to January 1, 1938. Nine gas wells and three oil wells have been completed in the Darrett horizon, which had produced about 5,000,000,000 cubic feet of gas and 86,000 bbls. of oil to January 1, 1938.

57. A. F. CRIDER (Shreveport, La.): Bellevue Oil Field.

The Bellevue oil field is in Township 19n, Range 11w, Bossier Parish, Louisiana. It is in the midst of the oil and gas producing area of northwestern Louisiana. Although the presence of a structure was long suspected from surface geology, the field was discovered in 1921 by a systematic plan of core drilling which located the crest of the uplift and proved it as an oil field. Geologically, Bellevue is probably a deep-seated salt dome in which salt has forced the overlying formations as much as 2,000 feet above their normal horizontal position. The deepest well drilled on the structure was the Harry Morgan No. 2 Smith, which was completed at a depth of 6,147 feet without encountering salt.

Bellevue is one of the outstanding shallow-producing fields of northern Louisiana. The oil is produced from the Nacatoch sand at the shallow depth of 300-400 feet, with some gas and oil from the contact of the Upper and Lower Cretaceous at a depth of about 1,800 feet.

The economy of drilling to such a shallow depth and the prolific nature of the Nacatoch sand has made Bellevue approach the Utopia of the oil man's dream. Up to January 1, 1938, the field had produced a total of 9,860,430 bbls. of oil from 900 acres or an average of 10,996 bbls. per acre and for the year 1937, the field produced 280,130 bbls.

Depression conditions caused the field to be closed during the years 1932 and 1933. All wells were abandoned and casing pulled on many of them. Production for the year previous to the shutdown, 1931, was 103,930 bbls. and for the year 1937, with only a part of the field reworked, it had reached a total of 280,130 bbls. A redrilling of one 80-acre tract which was abandoned and casing pulled in 1932, up to January 1, 1938, has resulted in a total new production of 3,000 bbls. per acre.

58. V. P. GRAGE and E. F. WARREN (Gulf Refining Co., Shreveport, La.): Lisbon Oil Field, Claiborne and Lincoln Parishes, Louisiana.

The Lisbon oil field, in Claiborne and Lincoln parishes, Louisiana, was discovered in December, 1936. From present information, it appears that the localization of oil is controlled by the lenticular development of porosity in the "Oakes" limestone which flanks the south edge of a broad structural nose. Production is obtained from the "Oakes lime" zone of lower Glen Rose age at an average depth of 5,200 feet. The effective porosity of the Lisbon producing horizon is highly variable in thickness, varying from 4 to 22 feet, with an average of 13 feet. The daily field allowable is 10,000 bbls. based on 3,252 developed acres as defined by the Louisiana Conservation Department. The field produced 2,405,000 bbls. from 150 wells during 1937.

V. P. Grage

E. F. Warren

The original oil-gas ratios were very low, varying from 50 to 300 cubic feet per barrel; consequently, no separators were used. With a rapid decline in bottom-hole pressures, the oil-gas ratios have shown a proportional increase. However, most wells have a ratio of less than 2,000 cubic feet per barrel at present. There are no established gas or water levels, despite apparent interzone communication within the "Oakes lime." It is the writer's opinion that thickness and the areal extent of the "Oakes" limestone horizon are the factors, independent of structure, which will control future developments of the Lisbon field.

59. R. T. HAZZARD (Gulf Refining Co., Shreveport, La.) and A. M. LLOYD (Sun Oil Co., Shreveport, La.): Resume of Louisiana Upper Cretaceous Fields.

A. M. Lloyd

Structure and stratigraphy of the Haynesville, Homer, Elm Grove, and De Soto-Red River fields show the close genetic relationship existing between the various producing areas of the Sabine uplift.

60. H. R. KAMB (Arkansas Fuel Oil Co., Shreveport, La.): Bear Creek, Driscoll, and Simsboro Gas Fields, Bienville and Lincoln Parishes, Louisiana.

These fields, in the North Louisiana embayment between the Sabine and Monroe uplifts, were discovered during the period from 1935 to 1937, inclusive. All three structures appear to be deep-seated, slight-uplift salt domes in a region which also contains several piercement-type domes. The structures, although suspended and prospected during a period of years, were not found productive until localized by seismograph and wells drilled to the lower Glen Rose and Travis Peak which lie at considerable depth. Production, gas only to date, is from lenticular sands in the lower Glen Rose and the Travis

Peak. Subsurface maps of the structures and a section across the embayment are presented.

61. S. A. PACKARD (Arkansas Fuel Oil Co., Shreveport, La.): Sligo Field, Bossier Parish, Louisiana.

A mildly faulted dome has localized gas and oil production in 10 or more horizons of Cretaceous and Comanche age in the Sligo field.

62. G. D. THOMAS (Shell Petroleum Corp., Shreveport, La.): Carterville-Sarepta and Shongaloo Fields, Bossier and Webster Parishes, Louisiana.

The Shongaloo and Carterville-Sarepta oil and gas fields are in the north part of Bossier and Webster parishes, Louisiana, just south of the Arkansas - Louisiana line. The Shongaloo field was discovered in March, 1921, and the Carterville-Sarepta gas was discovered in January, 1922, although oil was not discovered at Sarepta until 1924, and at Carterville until September, 1929.

The Shongaloo field is a dome-like structure, elongate east and west. The Carterville-Sarepta anticline lies immediately west of Shongaloo and consists of six small local closures along the main northwest-southeast axis of this anticline.

The Buckrange sand at 2,650 feet and two sands in the uppermost Tokio at 3,050 to 3,150 feet produce gas and oil at Carterville but only the Buckrange sand is productive at Shongaloo. The amount and extent of oil and gas is governed as much by variations in porosity and thickness of these three sands as by structure.

The disappointing recoveries of gas and oil per acre were due in a small degree to lack of great structural relief but in a large degree to lack of continuity and sufficient thickness of these three oil and gas horizons. Faulting cannot be recognized from present data on these structures. They are generally believed to be the result of a local small amount of flowage of salt beds which underlie sediments of early Comanche or older age in North Louisiana and part of South Arkansas. Beds older than middle Glen Rose have not been tested in either field.

The results of a deep test now drilling at Shongaloo will have an important bearing on possible deeper drilling at Carterville-Sarepta.

63. E. B. HUTSON (Standard Oil Co. of Louisiana, Shreveport, La.): Cotton Valley Field, Webster Parish, Louisiana.

The Cotton Valley structure is anticlinal with the axis trending northeast-southwest. The rate of dip increases with depth and the axis shifts southward.

There are four producing horizons developed to date: One in the Upper Cretaceous, one in the Glen Rose, one at the top of the Travis Peak, and the other in the Cotton Valley formation.

The discovery of oil in the Travis Peak formation during the summer of 1936 initiated a new period of development in the Cotton Valley field. The discovery of production in the marine sediments below the Travis Peak, heretofore undeveloped and little known in this region, is of great importance in the development of the oil resources of northern Louisiana.

64. C. I. ALEXANDER (Magnolia Petroleum Co., Lake Charles, La.) A. M. LLOYD (Sun Oil Co., Shreveport, La.), and R. T. HAZZARD (Gulf Refining Co., Shreveport, La.): North-South Geologic Cross Section Through Southwestern Arkansas and Western Louisiana.

This section is drawn through the western part of southwestern Arkansas and western Louisiana. It commences in the Pennsylvanian outcrops of the Ouachita Mountains of western Arkansas and bears southward across the Comanche Cretaceous, Gulf Cretaceous, Tertiary, and Quaternary formations to the Gulf of Mexico. The relationships of the surface formations to the subsurface beds are shown, together with the various oil- and gas-producing horizons.

65. B. W. BLANPIED (Gulf Refining Co., Shreveport, La.): Age and Correlation of the Salt Mountain Limestone, Clarke County, Alabama.

The Salt Mountain limestone, cropping out on the upthrown side of the Jackson fault, Clarke County, Alabama, is Wilcox (Eocene) in age. This limestone previously had been assigned to the Vicksburg group (Oligocene) in age, by Langdon, Smith, Vaughan, Hopkins, Cooke, and others. Data from core-drill tests proved that the stratigraphic position of this limestone is 1,100 feet below the Vicksburg group and 800 feet below the top of the Wilcox (Eocene) group. Cores of the Salt Mountain limestone obtained from shallow structure tests contain *Ostrea thirsae*, and specimens of the orbitoid foraminifera *Discocyclina*.

The Salt Mountain limestone of the type locality is correlated with the *Gryphaea thirsae* beds of Smith, Johnson, and Langdon and with the *Ostrea thirsae* beds of Cooke, which beds occur in the upper part of the Nanafalia formation of the Wilcox (Eocene).

Outcrops of limestone in Sabine Parish, Louisiana, containing *Ostrea thirsae* and large corals, are thought to be equivalent in age to the Salt Mountain limestone of Alabama.

Outcrops of the Tanlajas formation of the Chicontepec group of Eocene age at San Antonio Plaza in the State of San Louis Potosi, Mexico, contain *Ostrea thirsae* associated with *Discocyclina* sp. It is possible that the Tanlajas formation might be correlated in part with the Nanafalia formation of Alabama.

The Jackson fault has approximately 1,500 feet of throw.

66. A. C. MUNYAN (Assistant State Geologist of Georgia, Division of Mines, Mining, and Geology, Department of Natural Resources, Atlanta, Ga.): Recent Petroleum Activities in the Coastal Plain of South Georgia.

A brief discussion of the structural map prepared by Prettyman and Cave in 1923 is presented to show that their key bed was unwisely selected. Many wells drilled in the past are practically useless for correlation purposes today because of the lack of suitable records. In addition there are few aids to correlation outside of lithology, and it is suggested that a comprehensive study of the microfauna be made. Several comparisons are made to show the possible relation between topography and subsurface structure in three widely separated parts of the Georgia Coastal Plain, and hope is expressed that these areas will be investigated. News of leasing and future deep tests is brought up to date as far as possible.

67. OLIVE C. POSTLEY (U. S. Geological Survey, Washington, D. C.): Oil and Gas Possibilities of the Atlantic Coastal Plain From New Jersey to Florida. Published by permission of the Director of the Geological Survey.

On account of recent interest in oil possibilities in parts of the Atlantic Coastal Plain, especially southern Georgia and Florida, this paper gives a summary of the known general geologic features of states along the Atlantic Coast from New Jersey to Florida and of wells drilled in the region to depths of 1,000 feet or more. No oil in commercial amounts has meen found in the Atlantic Coastal Plain, and the aggregate thickness of the Cretaceous and Tertiary sediments in most parts of it is not sufficient to encourage the hope that oil pools will be found; in fact, wells at several places have encountered basement rocks at rather shallow depths. In southeastern Georgia and southern Florida, however, where only a few deep wells have been drilled, the basement rocks lie at greater depth, and the deeply buried Cretaceous and Tertiary formations are little known. Further drilling will be required to determine their character and to test their oil possibilities.

68. HARVEY WHITAKER (Bridwell Oil Co., San Antonio, Tex.): Hoffman Field, Duval County, Texas.

The Hoffman field is in the Government Wells district of Duval County in Southwest Texas. Production is found in five sands, in the *Textularia hockleyensis* zone of the Jackson formation, Upper Eocene in age. The sands range in depth from 2,550 to 2,900 feet. The field is on a broad anticlinal nose with probably not more than 40 feet of closure on the Jackson. Stratigraphic variations are as important to accumulation as structural relief. Variations in gas-oil and oil-water contracts are pronounced and are probably due to changes in porosity and permeability of the sands although there is some evidence of water coning. No estimate of reserves is practicable except by comparative method. The field is still in the development stage.

69. C. L. MOODY (Ohio Oil Co., Shreveport, La.): Earlier Mesozoic History of the Northern Gulf Region.

Earliest events in the geologic history of the northern Gulf region following the folding of the Ouachita Mountain system include: (a) The downsinking of Llanoria accompanying the carving of the Wichita pene-plane and (b) the down-warping of the Ouachita Mountain foreland forming a basin in which accumulated rock debris under progressively arid conditions which culminated in the formation of a great salt lake. Dessication led to the formation of a thick bed of salt. Subsidence admitting the first Mesozoic marine waters to the region did not occur before later Jurassic time. Record of successive uplift and subsidence with strandline fluctuation is found in the alternation of nonmarine and marine sediments of Lower Cretaceous age which include among other well individualized formations a remarkably widespread marine anhydrite deposit. Lower Cretaceous deposition was terminated by widespread uplift accompanied and followed by long continued deep

weathering and effective corrosion. Igneous magma was intruded and toward the end of the erosion period the products of vulcanism were accumulated in the encroaching Cretaceous sea.

70. STANLEY C. HEROLD (Shell Oil Co., Los Angeles, Calif.): Criteria for Determination of Time of Accumulation Under Special Circumstances.

The problem of determining the time of accumulation is related closely to that of determining a sequence of geological events. It, in fact, includes the one of determining the time of unconformity. Thus far, then the criteria of the two problems are identical, and the determination is dependent on geological observations in the region being given consideration. Major and minor unconformities have distinct significances with respect to migration and accumulation. But the determination of the time of accumulation is also dependent on criteria which are mechanical in nature, and which are only to be observed during drilling and production.

A diagram entitled, "Restricted Sequence of Geological Events," is used as a basis of the present treatment of the subject. The axis of time is divided into nine periods, each of which has particular significance with respect to the problem. This diagram may be proved deficient for many regions. It is designed to cover the general problem only in so far as we find it necessary for the consideration of accumulation under the special circumstances considered here.

Accumulations are classified according to two categories. The first relates to such as are found in porous strata of Tertiary age, and the second relates to others in porous strata of Paleozoic age. Which of the two is appropriate for strata of Mesozoic age is at present unknown because of the lack of sufficient data.

Accumulations of the second category are found from North Texas to the Province of Ontario, where they lie in strata ranging in age from Silurian to Permian. Migration and accumulation took place before the truncation by erosion or the subsidence of the petroliferous strata along their upturned edges around the area in which the accumulations are situated, and any subsequent elevation or subsidence, folding, warping, or tilting of the accumulations was not accompanied by a lateral shifting of the pools to accommodate new structural conditions. Accumulations are, therefore, commonly found on a flank of an otherwise barren anticline, on a terrace, or in a syncline. Occurrences of this sort are important factors in early discussions (1865-1885) relating to the anticlinal theory of accumulation.

71. W. BAXTER BOYD (Continental Oil Co., Ponca City, Okla.): Jesse Pool, Pontotoc and Coal Counties, Oklahoma.

The development of the Jesse pool, in the southeast part of the Franks Graben, followed shortly after the discovery of the Fitts pool.

Both the stratigraphy and the geological history of these pools are closely related. The Jesse pool lies in a large anticline, which is faulted on the south side. The faulting ordinarily occurs as a series of step faults, and is regarded as the controlling factor for trapping the oil. This anticline is almost as large as the Fitts anticline, but in general the porosity and permeability of the reservoir rocks are not as good. Consequently, the productivity will be considerably less in the Jesse pool than in the Fitts pool. The major structural movements of the Arbuckle Mountains are reflected in the Jesse anticline; the first major structural uplift occurred at the close of Atoka time (early Pennsylvanian), and the second major uplift occurred in the late Pennsylvanian time. Oil or gas is produced from Pennsylvanian, Siluro-Devonian, and Ordovician horizons at depths ranging from 1,800 to 4,700 feet. The most prolific production in this group is from the "Wilcox" sand at the crest of the anticline, extending over a small area of 120 acres. The total estimated productive area of the Jesse pool is 2,850 acres.

72. ALLEN W. TILLOTSON (Tulsa): Olympic Pool, Hughes and Okfuskee Counties, Oklahoma.

The Olympic pool is in the Seminole district of south central Oklahoma. The discovery well was completed in July, 1934. The principle producing horizon is the Senora sand of Pennsylvanian age. Minor production has been and is obtained from Calvin sand and Cromwell sand both of Pennsylvanian age and Hunton limestone of Devonian age.

Senora sand production is from a typical shoreline bar extending 6½ miles north and south with a maximum width of 1¼ miles. The average total depth of Senora sand wells is 1,800 feet.

Total production to January 2, 1938, is 7,530,575 bbls. of 36° Baume oil from 326 wells. Average daily production for the week ended January 2, 1938, was 6,975 bbls.

73. T. C. HIESTAND (Indian Territory Illuminating Oil Co., Bartlesville, Okla.): Studies of Insoluble Residues From the "Mississippi Lime" of Central Kansas.

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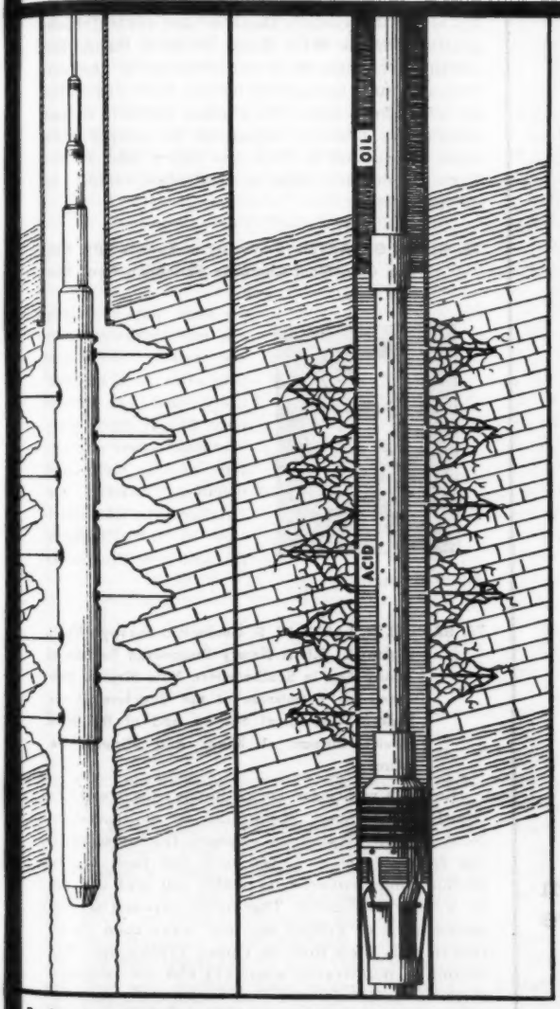

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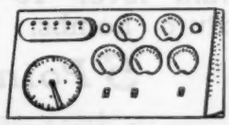

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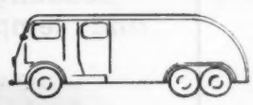

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lime" into natural divisions has been attacked by geologists in the field and microscopists studying samples from wells, and is still unfinished in many respects. In as much as the formation attains a thickness of several hundred feet maximum, or in many cases of wells drilled at the crests of buried anticlines its absence is determined, some knowledge of this formation is essential to understand the geology of Kansas. Furthermore, very profitable recoveries of oil from the formation in part of the wells stands in contrast to the disappointing recoveries in other instances; and the question arises whether the better recoveries are associated with particular zones. Even the differentiation between Pennsylvanian basal conglomerate and the "Mississippi lime" is in many places exceedingly difficult.

Studies based on McQueen's method of preparing and interpreting insoluble residues, and concerning outcrop samples from western Missouri and northwestern Arkansas as well as cable-tool cuttings from wells in Kansas and Missouri, indicate that definite zonal correlations can be established across central Kansas. These zones are characterized chiefly by the distinctive flints or cherts which have limited vertical ranges and wide regional distribution, except the basal zone which is less commonly cherty but carries distinctive fossils or associated minerals. Commercial production appears to be confined to but two of the zones, with porosity occurring either in crystalline to oolitic limestone or in porous, non-vitreous chert.

The zones appear to be bounded by unconformities or disconformities. Variations in thicknesses of zones are due probably to both factors of interzonal warpings and of bed-by-bed thickening and thinning. Observations to date indicate that the processes of warping were the beginnings of local folds which by rejuvenation in early Pennsylvanian time culminated into the sharply defined features often called the "granite ridge" type of anticline. The overall thickness of the "Mississippi lime" in any given instance therefore depends on either or both the factors of erosion at the top (Mississippian-Pennsylvanian unconformity) or combined thicknesses of the several zones, involving interzonal "breaks."

On the south flank of the Central Kansas uplift the "Mississippi lime" rests directly on the Viola limestone in a number of localities. Insoluble residues facilitate detection of this contact. In other instances Mississippian has been miscorrelated with Arbuckle limestone from ordinary microscopic examination, whereas residues offer good evidence to distinguish between these two stratigraphic units.

74. R. L. DENHAM (Humble Oil & Refining Co., Midland, Tex.): Means Field, Andrews County, Texas.

The Means field, north central Andrews County, is on the eastern flank of the central basin platform of the West Texas Permian Basin. The subsurface structure is not reflected at the surface, any such indications having been obliterated by wind-blown sand. The shallow markers do not indicate as much structure as the deeper horizons. Production is from the upper part of the Permian dolomite and is controlled mainly by structure.

75. GLENN G. BARTLE (University of Kansas City, Kansas City, Mo.): Cherokee Formation Near Kansas City.

This paper locates the gas wells drilled in the newly discovered Sni-A-Bar field immediately east of Kansas City, Mo. It gives cross sections based on the logs of the wells and discusses briefly the stratigraphic irregularities in the Cherokee formation of the Lower Pennsylvanian.

76. SAMUEL G. LASKY (U. S. Geological Survey, Washington, D. C.): A Newly Discovered Section of Trinity Age in Southwestern New Mexico. Published by permission of the directors of the Federal Geological Survey and of the New Mexico Bureau of Mines and Mineral Resources.

Lower Cretaceous rocks newly discovered in the Little Hatchet Mountains in southwestern New Mexico display an exposed thickness ranging from 17,000 to 21,000 feet, the base of the section being covered by valley fill and the top by Tertiary volcanics. The entire exposed section seems to be of Trinity age, and more than 15,000 feet of it is Glen Rose or Upper Trinity age. The section is noteworthy also: (1) For the presence of three disconformities that indicate the removal of thicknesses of rock measurable in thousands of feet; (2) for a high proportion of conglomerate, mostly intraformational; (3) for a repetition of zones of similar lithology and fauna, four-fold with respect to some zones; and (4) for a great thickness of basaltic volcanic rocks. The section has been divided into seven formational units to which local names have been given.

The more significant fossils thus far identified include *Douvilleiceras*, *Beudanticeras*, *Exogyra quitmanensis*, a large *Pecten* that is characteristic of Taff's "Quitman bed," and *Orbitolina*. The formations as a group are equivalent in age to part of the Bisbee group of Arizona, but specific correlation of individual formations with members of the Bisbee group is not possible. Some of the formations in the Little Hatchet Mountains apparently can, however, be corre-

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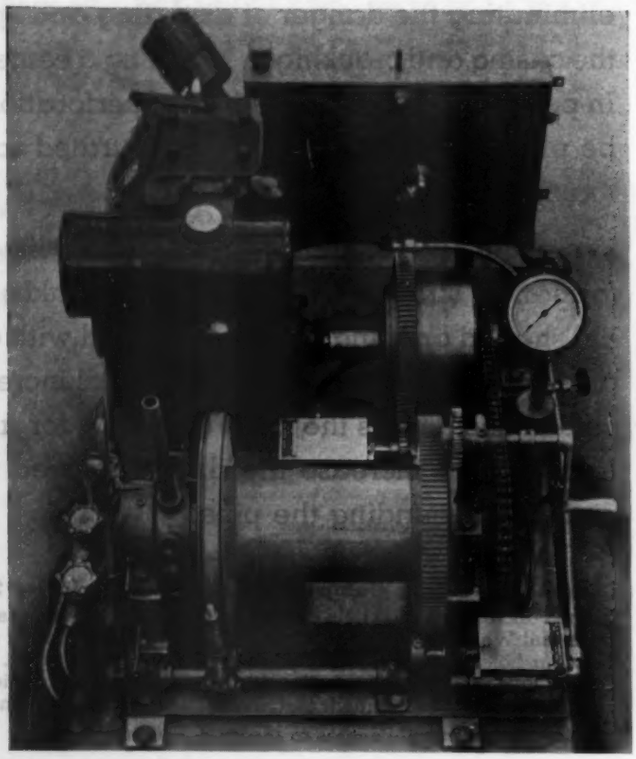

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lated with exposures in the neighboring ranges.

With the exception of those of volcanic origin, the rocks are beach and shallow-water deposits, including some fresh-water beds. They were deposited in a rapidly subsiding basin of geosynclinal dimensions whose shore-line was generally near and at times within what is now the north half of the Little Hatchet Mountains, the shoreline shifting back and forth over a strip perhaps 10 to 20 miles wide. The center of volcanism from which the volcanics were derived seems to have been near the edge of the basin and somewhat on the landward side.

77. C. LATHROP HEROLD (Shell Petroleum Corp., Tyler, Tex.): Geology of the Salinas and Jamesburg Quadrangles, Monterey County, California.

The Salinas and Jamesburg quadrangles lie immediately east and southeast of Monterey Bay in the central coastal region of California. Included are parts of the Gabilan Range and the Salinas Valley, and almost the full width of the northern Santa Lucia Range.

The crystalline basement consists of the Sur and Gabilan metasediments (Paleozoic?), intruded by the Santa Lucia quartz diorite (Jurassic?). On this basement rest the following sedimentary formations: Church Creek (marine Eocene-Oligocene); Temblor (marine Middle Miocene); Monterey (marine Middle? and Upper Miocene); Poncho Rico (marine Miocene-Pliocene transition); Paso Robles (non-marine Pliocene-Pleistocene); Chamisal (non-marine Pleistocene); and alluvial deposits (Recent).

Faulting dominated over folding during deformation of this area, due chiefly to the exposure of the crystalline basement over large areas and to the comparatively thin overlying sedimentary prism. This is in contrast to the dominance of folding in other Coast Range sectors where the sedimentary column is very thick. The faults have a northwest trend. Maximum movements occurred during the Pleistocene; earlier activity is indicated, but it cannot be dated in this area. The northern Santa Lucia Range is characterized by a series of longitudinal thrust faults which dip inward from both sides toward the center of the range. The northern Salinas Valley is a structural depression formed by the westward tilting of a block against the King City fault along the western margin of the valley.

78. B. W. BLANPIED and ROY T. HAZZARD (Gulf Refining Co., Shreveport, La.): Structure and Stratigraphy of the Hatchetigbee Anticline and Jackson Fault Areas, Alabama.

Eugene A. Smith was the first geologist to recognize evidences of folding along the Tombigbee River in Clarke, Choctaw, and Washington counties, Alabama. O. B. Hopkins of the U.S.G.S. was the first geologist to map the Hatchetigbee anticline and Jackson fault areas, a report of which was published in 1916. Hopkins estimated the maximum throw on the Jackson fault to be 450 feet. Recognition of the correct stratigraphic position of Salt Mountain limestone, from core-drill data, shows a maximum throw of 1,500 feet. Two newly discovered faults, the trends of which roughly parallel the axis of the Hatchetigbee anticline, are mapped. These are: The West Bend fault in the syncline north of the Hatchetigbee anticline with a downthrow of 750 feet south; and the Frankville fault on the south flank of the anticline, with downthrow south of 200 to 300 feet. The Hatchetigbee anticline has a maximum reversal of dip of 1,500 feet into the West Bend fault. Eight test wells on the Hatchetigbee anticline have been drilled into the Eutaw sand (Upper Cretaceous); six of these into the Tuscaloosa red beds, with negative results. The deepest well, a 7,500-foot test on the western closure of the Hatchetigbee anticline recently was abandoned in red beds which are thought to be of Lower Cretaceous age.

79. W. ARMSTRONG PRICE (Corpus Christi, Tex.): Tentative Correlation of Gulf Coast and Mississippi Valley Pleistocene Deposits.

The Mississippi floodplain has a relief of 25 to 30 feet, and gradients increasing from the very low slope of the delta to 1 foot in 0.625 mile near Cairo, Ill. Parallel with this gradient curve is that of old valley remnants which seem to represent a single surface of deposition, the deposits (Beaumont) filling an entrenched valley of late Pleistocene (pre-Beaumont) time.

The Pleistocene valley surface has a relief of 30 feet, its lows standing about 15 feet above the tops of natural levees of the modern floodplain, which was a relief of 25 to 30 feet. A maximum relief of 70 feet is thus found in the floodplain in Recent and Pleistocene deposits.

The ancient valley is well marked west of Crowley's Ridge from Cape Girardeau, Mo., to Helena, Ark., the Mississippi having joined the Ohio at the north end of Crowley's Ridge when Pleistocene erosion had made gaps in it. A low terrace of Arkansas River helps to fill the gap in correlation between Crowley's and Mason ridges. The latter carries the old valley surface to the vicinity of Sicily Island, where the Catahoula outcrop has produced a narrows in the valley. Below Sicily Island the Prairie terrace of Red River and the surface of the Avoyelles Hills bring the correlation to the head of the Mississippi-Red delta plain.

It is hoped by field work to carry the correlation across an unmapped area between Avoyelles Hills and the eastern termination of two abandoned Pleistocene shorelines plainly marked on the Pleistocene delta plain (Beaumont) in the Opelousas-Crowley-Gueydan-Lake Charles area of southwestern Louisiana. These shorelines stand at approximately 12 and 25 feet above sea. The problem is not simple, being complicated by the presence of four or more terraces on Red River in Louisiana.

Five-foot contour maps of the alluvial valley by the army engineers and U. S. Geological Survey have furnished the basis of the work. Highway elevations and profiles will be used to complete it. Data from airplane mosaic photographs have been used in the study of the Pleistocene delta plains. The hope for a successful correlation across the Pleistocene delta is based on expected changes in slope between elevated shorelines, even where these are much overlain by latest Pleistocene deltaic material, this expectation being based on findings in other coastal deltas.

Much assistance has been received from geologists of the Louisiana Geological Survey, from Donald Barton's interpretations of aerial photographs in the delta, from the army engineers and from the Geological Society of America, which is financing the work. Several field trips have been made over the delta and the southern half of the floodplain.

80. W. ARMSTRONG PRICE (Corpus Christi, Tex.): Geology of Rio Grande Delta, Texas and Mexico, Interpreted by Geomorphology and Soils.

Reasons are given for mapping a large Beaumont Pleistocene delta plain—55 by 105 miles—and a Recent delta plain—40 by 70 miles. Lissie Pleistocene sands margin the delta inland and a large sand-covered plain with scattered sand dunes crosses the northern extremity.

The semiarid, subtropical, monsoonal wind type of climate is unique for the Gulf Coast of the United States. Climatic influences modify the surface features of the delta and its environs.

An irrigated oasis in a semidesert plain covered with thorny brush, the "Lower Valley" is geographically interesting and historically important. It now has artificially created deep-water ports. Much detailed information is now available for the Texas half, but little for the Mexican portion. One-foot contour maps, published soil reports, published and unpublished climatological studies, airplane mosaic photographs, and much field work form the bases of the study. Use of geomorphology in oil finding is discussed.

81. ARTHUR G. HUTCHINSON (United British Oilfields of Trinidad, Ltd., Point Fortin, Trinidad, British West Indies): Upper Eocene Unconformity of Trinidad.

82. FREDERIC A. BUSH (Sinclair-Prairie Oil Co., Tulsa): Geology of the Moore Field, Cleveland County, Oklahoma.

83. WARREN B. WEEKS and CLYDE W. ALEXANDER (Phillips Petroleum Co., El Dorado, Ark.): Shuler Field, Union County, Arkansas.

The Shuler field, 18 miles west and south of El Dorado, Ark., was discovered on April 6, 1937, by the Lion Oil Refining Co. and Phillips Petroleum Co. No. 1-A Edna Morgan in section 18, Township 18s, Range 17w. The field is on an anticline lying on a southeastward plunging Upper Cretaceous nose. The structure was determined by seismic exploration by the Phillips Petroleum Co. who commenced the discovery well. The well was later deepened and completed in partnership with the Lion Oil Refining Co.

The first well was completed at a depth of 5,559 feet in a sand which was found to be the upper of several lenticular producing sands lying within a zone of 300 feet near the top of the Bossier formation of Mesozoic age. Of the 15 wells completed in this Morgan sand zone, 4 have since become dead. The zone produced 840,849 bbls. up to January 1, 1938.

E. M. Jones and others found deeper production in September, 1937, at a depth of 7,616 feet, in a sand the basal part of the Bossier formation. This Jones sand with an average thickness of 65 feet apparently extends over a much greater area than the upper zone. Five hundred sixty acres had been proved for production by February 1, 1938. This sand had produced 333,543 bbls. of oil to January 1, 1938.

The original discovery well was deepened and recompleted on October 22, 1937, at a depth of 7,688 feet as a gas and distillate well from still a third horizon, the Reynolds oolite of the Smackover limestone. By the end of the year this well had produced 34,028 bbls. of distillate and 800,000,000 feet of gas.

84. R. G. REESE (Standard Oil Co. of California, Los Angeles, Calif.): El Segundo Oil Field, California.

The El Segundo oil field, at the west edge of the Los Angeles Basin oil-field district, about midway between the Playa del Rey and Torrance fields, was discovered in August, 1935, by the Republic Oil Co. Approximately 65 tests have been completed in the development of the field, and there are now 55 wells producing 22,000 bbls. daily. The developed area, limited on three sides

by noncommercial wells, covers an area of approximately 630 acres.

The only oil zone present in the field occurs at the base of the sedimentary rocks, which vary in thickness from 6,900 to 7,600 feet. The reservoir rock is the basal conglomerate and porous schist occurring between impervious Upper Miocene shales and solid "Franciscan" schist. The conglomerate varies in thickness from 1 to 105 feet, and the schist is locally porous and permeable due to fracturing, weathering, and small solution cavities. The largest wells have been obtained where schist of this nature has been encountered.

The conditions which make this area favorable to accumulation are attributed primarily to the overlap of Miocene sediments on a schist "high." The anticlinal nature of the structure, as reflected in the older sediments, disappears at progressively younger datum planes and is believed due to the influence of the high surface over which the sediments were deposited. Normal faults, which intersect the Miocene section only, are apparently caused by adjustment of the sediments along the steeper faces of the schist mass.

85. M. KAMEN KAYE (Caracas Petroleum Corp., Cuidad Bolivar, Venezuela): Review of Problems in the Geological Succession of Venezuela.

The geology of central Venezuela is treated as a study of three tectonic phases: The schistose Coast Range, the foothill sections, the post-foothill sequence. These are sketched in relationship to the main geosyncline, their problems stated, and recommendations made relevant to those problems.

86. GORDON ATWATER (Skelly Oil Co., Houston, Tex.): Isopach Contouring of Faulted Formations.

The problem of correct construction of isopach lines in the vicinity of faults, where the formations are abnormally thin as a result of missing section, becomes apparent in making isopach or interval maps of various formations on local structures. The problem was studied by means of progressive cross sections along faults of increasing amount of throw for each different combination of direction of dip of the fault to the direction of thickening of the formation. Beds thickening in direction of dip of fault, beds thinning in direction of dip fault, the strike of the fault parallel to direction of maximum thickening, and the strike of the fault oblique to the direction of maximum thickening, were studied by construction. A distinctive pattern, or behavior of the isopach lines in crossing the fault zone, was noted for each combination. Block diagrams are used to illustrate the relation of the isopach lines to the fault zone. The application of the procedure to an isopach study of the *Discorbis-Heterostegina-Marginulina* interval over a Gulf Coast oil field is presented.

87. ROLLIN ECKIS (Richfield Oil Co., Bakersfield, Calif.): Significance of Stratigraphic Distribution of Recent Oil and Gas Discoveries in the San Joaquin Valley of California.

Beginning in the summer of 1936 and continuing to the present, a series of important oil discoveries made in the San Joaquin Valley has led to a profound change in the trend of geologic thought and exploration.

Previous to 1936 the oil-producing areas were practically confined to the eastern and western margins of the marine Pliocene basin, where the Miocene and older formations approached the surface or cropped out.

The discovery of Ten Section oil field in 1936 midway between the eastside and westside fields opened the great central valley area to an intensive campaign of exploration, that has to date yielded at least four additional important productive areas. With the exception of the new Eocene deep zone at Kettleman Hills, recent discoveries have been confined to Upper and Lower Miocene sands, all of which have their counterparts in the older producing areas, along the basin margins. It is probably significant with regard to origin, that no commercial production of oil has been obtained from Pliocene sediments in the newly discovered structures in the central part of the Pliocene basin, where Pliocene sands are separated by dense shales from the underlying organic Miocene sediments. Pliocene sediments, on the other hand, yield a large portion of the oil from fields along the basin margin.

Production from continental Upper Miocene and Pliocene sediments of the east side fields occurs in areas underlain by marine Miocene organic sediments, which probably have provided the source.

Intensive exploration now is proceeding northward through the central valley toward the northern margin of the marine basin in the hope of discovering new areas of oil accumulation in horizons that are productive farther south.

Somewhat less intensively, the southern border of the San Joaquin basin is being explored, and with the addition of a new productive area in the region, there is encouragement for the idea that the belt of eastside and westside field may eventually be joined around the south margin of the valley.

Although discoveries of the past two years have proved that Miocene sediments may be found productive in the deeper central part of the marine Pliocene basin as well as around its margins, productive areas have been opened only in about one-third of the Pliocene basin. Parts of the remainder where Pleistocene and Pliocene formations exceed 10,000 feet in thickness will have to await further advance in drilling technique before exploration will become practical.

It seems improbable that important commercial accumulations of oil will be discovered in continental Miocene and Pliocene sediments far beyond the limits of the marine Miocene basin.

88. LON B. TURK (Oklahoma City, Okla.): A Study of Minor Folds: Their Relation to Production and the Major Structures.

89. H. M. HORTON (Superior Oil Co., Houston, Tex.): Bosco Oil Field, Acadia and St. Landry Parishes, Louisiana Gulf Coast.

90. J. BRIAN EBY (Sterling Building, Houston, Tex.): Relation of Geological and Geophysical Exploration to Discoveries and Reserves. Permission of U. S. Bureau of Mines.

91. CLAUDE C. ALBRITTON, JR. (Southern Methodist University, Dallas, Tex.): Summary of Results of a Geological Survey in the Malone Mountain Area, Hudspeth County, Texas.

The Malone Mountains of southern Hudspeth County are notable in that they contain the only marine Jurassic and the oldest Cretaceous strata known within the state.

Sedimentary rocks composing the Malone Mountains and their outlying hills belong to the Permian, Jurassic, and Cretaceous systems. The Permian strata (Briggs formation) are evaporite deposits consisting of gypsum and anhydrite with interbedded limestone. The oldest exposed limestone member of the Briggs contains marine invertebrate fossils like those of the Leonard formation in the Glass Mountains.

Resting unconformably on the Briggs are Jurassic strata (Malone formation—emended), dominantly coarse clastic sediments which were deposited near the shore during the Kimmeridgian and Portlandian stages. The Malone formation contains the large marine invertebrate fauna described in 1905 by F. W. Cragin. Some investigators have maintained that while the ammonites of the Malone fauna are Jurassic, some of the pelecypods (notably the Trigonias) are Lower Cretaceous. This, however, cannot be true, since the pseudo-Cretaceous pelecypods occur in strata with Jurassic ammonites.

Conformably succeeding the Jurassic beds are sediments of Lower Cretaceous (Valanginian) age, referred to the Torcer (emended) formation. Above the Torcer are the Las Vigas (?) and Glen Rose formations, which together compose outlying hills south of the Malone Mountains.

The maximum thickness of strata exposed in the Malone Mountains (outlying hills excluded) is approximately 2,000 feet. Of this thickness some 600 feet belong to the Permian, 1,000 feet to the Jurassic, and 400 feet to the Cretaceous. The thickness of the Jurassic is highly variable; within the limits of the area surveyed, the Malone formation ranges from 1,015 to 150 feet thick.

The Malone Mountains lie within and near the northern termination of the Sierra Madre Oriental orogenic belt. The Mesozoic and older rocks of the area are strongly folded and locally broken by normal and thrust faults with displacements ranging from a few feet to several hundred feet. There is no field evidence to indicate that the Malone Mountains are bounded by large normal faults. Several hypotheses regarding the major structural relationship between the Malone Mountains and the Finlay Mountains on the north are discussed and evaluated in the light of present knowledge concerning the area.

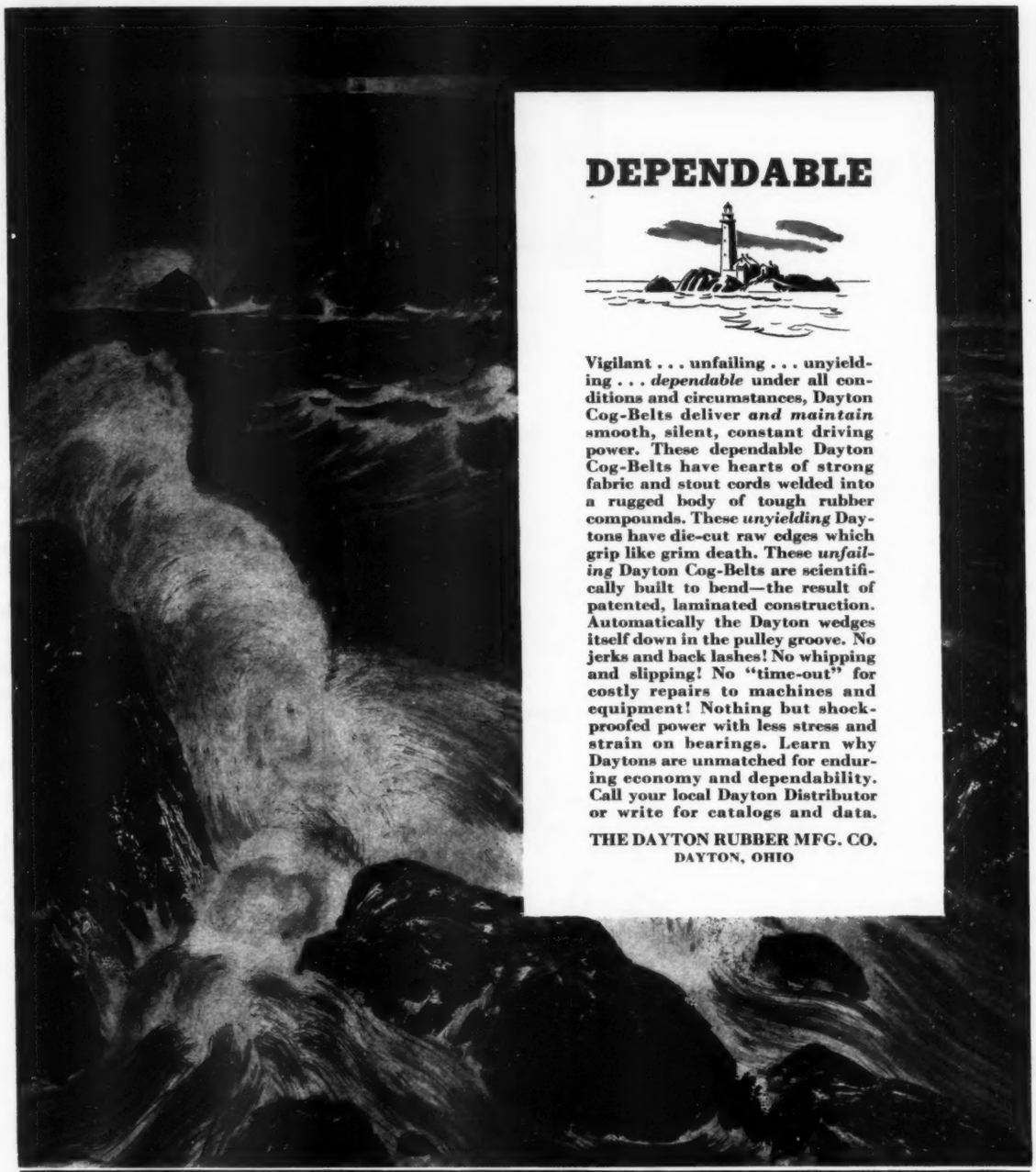
92. ROBERT ROTH (Humble Oil & Refining Co., Wichita Falls, Tex.): Triassic Period in the United States.

The Paleozoic and Mesozoic borderline problem is outlined both in Europe and in the United States and the presence of passage beds and attending difficulties mentioned. Various phases of deposition found in the Triassic are discussed. The types of climate found in the three divisions of the Triassic, and the tectonic states of these divisions are considered. Several paleogeographic maps are shown which delimit the various Triassic seas and areas of continental deposition indicated. In closing the possible age of the lower red beds found in the deep wells of southern Arkansas and northern Louisiana is discussed with some detail.

93. ALEXANDER DEUSSEN and KENNETH DALE OWEN (Houston, Tex.): Correlation of Surface and Subsurface Formations in Two Typical Sections of the Gulf Coast.

As an aid in the graphic portrayal of the relationships between the surface formations as exposed on the outcrops of the beds and the more fully developed geologic section basinward as revealed by well formation, two typical Gulf Coast cross sections are presented for your consideration.

The first of these sections is taken in the lower part of the Coastal area or in Southwest Texas as that province is sometimes known and extends from central McMullen County on the northwest through parts of Live Oak, Jim Wells, and Nueces counties and terminates at the Flour



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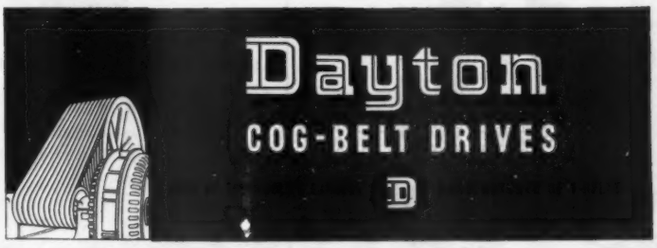

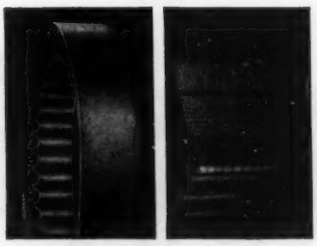

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Bluff oil field just south of Corpus Christi, Tex. The second of these sections, also a dip section, is taken farther east and typifies the geologic relationships in that part of the Gulf Coast just west of Houston. It extends from northern Fayette County southeast and crosses Colorado, Wharton, and Matagorda counties and terminates at the present coast line.

The sections are taken transverse to the depositional and structural strike of the beds and cross formations ranging in age from Jackson of the Eocene to Beaumont clay and Recent material.

These sections represent a comparatively new approach to the study of Gulf Coast geology and are offered more as illustrations of the possibilities of this method than as the final answer. However, many interesting relationships, such as the downdip thickening of certain formations, the complete wedging out updip of others and the variations in the formal ranges with the changes in sedimentation are strikingly apparent.

The writers believe that this method offers a very definite contribution to economic geology. It will prove an invaluable aid in the study of sands and their distribution in the Gulf Coast sediments.

94. J. ELMER THOMAS (Houston, Tex.): The Soviet Method of Estimating Oil Reserves.

A Tribute to the Driller

DRILLERS are the pioneers of today. To their vision and adventuresome effort in developing new oil frontiers from Spindle Top to KMA, we owe the largest single source of Southwestern wealth, the third largest industry in the United States. Fort Worth Banks appreciate these facts and are proud that many successful drillers, companies and their employees in the Mid-Continent Area are their customers. In many instances the ample resources of Fort Worth Banks have contributed to their success. Our loan officers will be glad to discuss your banking requirements. Come in — visit with us.

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95. G. S. BUCHANAN (Adams Louisiana Corp., Houston, Tex.): Cheneyville Oil Fields, Rapides Parish, Louisiana, and Its Relation to the Areas of Mother Salt Deposition.

96. H. L. RAU and K. A. ACKLEY (Carter Oil Co., Seminole, Okla.): Geology and Development of the Keokuk Pool, Seminole and Pottawatomie Counties, Oklahoma.

The Keokuk pool, Seminole and Pottawatomie counties, about 10 miles north of the town of Seminole, Okla., in 10 and 11, Range 6e, is unique in that it was the first pool in Oklahoma to maintain reservoir pressures through voluntary restriction in the rate of production. It is located in one of the few areas where the Misener sand is of sufficient thickness to afford good reservoir conditions.

The structure of the Keokuk pool is anticlinal and is faulted on the east side. This area was probably affected by at least three periods of structural adjustment, but the one which is probably most responsible for the faulting and folding occurred in early Pennsylvanian or late Mississippian time.

From 106 wells producing from the Misener Hunton, the pool has produced 6,362,224 bbls. of oil up to January, 1938. This figure averages 60,021 bbls. to the well on a 20-acre spacing and covers practically all of the productive acreage. A final recovery of 8,000 bbls. of oil per acre is anticipated.

97. GEORGE H. NORTON (Atlantic Refining Co., Wichita, Kans.): Permian Red Beds of Kansas.

98. ROY W. HALL (Wichita, Kans.): History of Central Kansas Uplift.

99. MARVIN TAYLOR and JOHN L. GARLOUGH (Wichita, Kans.): Geology of Southwest Kansas Gas Area.

SOCIETY OF ECONOMIC GEOPHYSICISTS

TUESDAY, MARCH 15
WEDNESDAY, MARCH 16

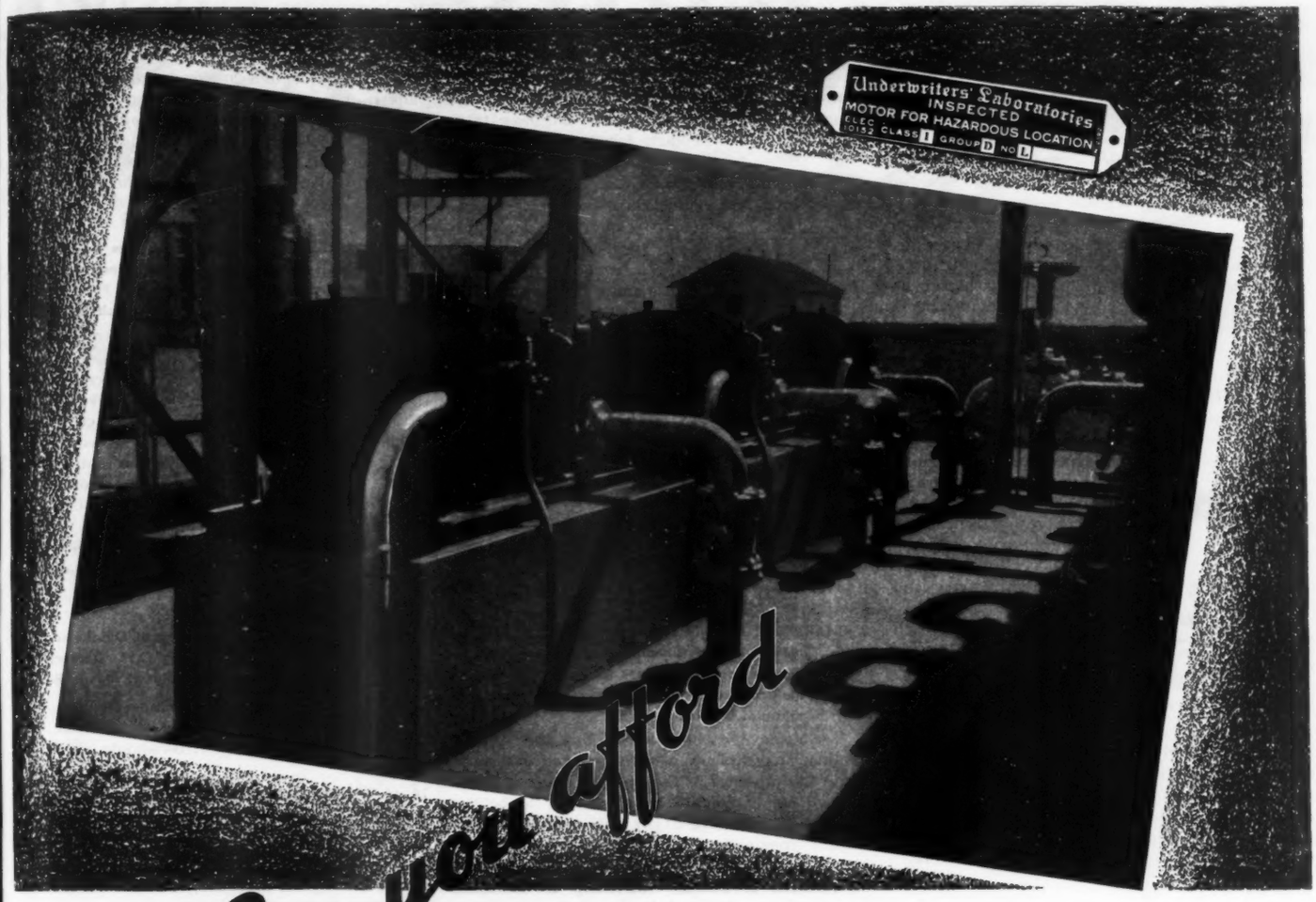
1. M. P. WHI[illegible] (Gulf Oil Corp., Ardmore, Okla.): A Common Language.

A brief discussion of some pertinent questions

of method of procedure and interchange of ideas pertaining to paleontological works.

3. R. DANA RUSSELL and LEO W. HOUGH (Louisiana State University, Baton Rouge, La.): A Test of Petrographic Correlation of Oil Sands in the Gulf Coast.

Twenty-four sand samples from the Bosco field, Louisiana, were furnished to the writers for study as a test of petrographic methods of correlation. Positive correlation of the samples, based both on Schlumberger data and paleontology, had been made previously by the Superior Oil Co., but this information was withheld by request. The samples were identified only by number, and no information was furnished except that six sands were represented. The test, therefore, was made particularly difficult by the lack



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of any information on the relative depths of the sands or the number and spacing of the wells from which they were secured, the relatively small number of samples from each sand, and the fact that the samples proved to be very similar both mineralogically and physically. Study of the data from the analyses, however, resulted in the correct classification of the samples into four groups, two of which included two adjacent sands. This would appear to be a clear demonstration of the value of petrographic methods in subsurface correlation, especially in view of the rigorous conditions of the test.

2. BROOKS F. ELLIS (New York University, New York City): A Catalog of Foraminifera.

An illustrated catalog of the genera and species of foraminifera is being compiled. Type reference, type description, type species and subsequent references are given for each genus; and type reference, type figure, type description, type locality and level, depository of types, and subsequent references are given for each species. These materials are arranged alphabetically by genera, and within each genus alphabetically by species and are coordinated by an index to synonymy. This catalog is practically completed and portions have already been set up on composing machines in preparation for offset reproduction. The American Museum of Natural History, under whose sponsorship this work has been done, plans a permanent department to continue this undertaking.

4. M. E. UPSON (Gulf Oil Corp., Fort Worth, Tex.): Pre-Pennsylvanian Stratigraphy and Microfauna of the Deep Wells of West Texas.

A lithological description and microfaunal content of pre-Pennsylvanian sediments encountered in wells seeking Ordovician production in West Texas.

5. CHARLES E. DECKER (University of Oklahoma, Norman, Okla.): Preliminary Paper on Didymograptus Protobifidus in North America.

Didymograptus protobifidus has been discovered in four different localities in the Arbuckle Mountains and one in the Wichita Mountains of Oklahoma. It has been recognized by the writer from the Marathon region of Texas and from the limestone in the Grayson mine near Smithville, Ark. It is believed that it will be recognized in the Lower Deepkill of New York when that formation is restudied, and it doubtless will be found elsewhere. It is the purpose of the writer to illustrate specimens from the various regions and compare them with the type from Great Britain, as described by Gertrude Elles.

6. CHARLES E. DECKER (University of Oklahoma, Norman, Okla.): Didymograptus Protobifidus, Its Transients and Related Forms in the Upper Arbuckle Limestone of Oklahoma.

Not only has *Didymograptus protobifidus* been found in five different localities in Oklahoma, but along U. S. Highway 77 this species with its transients and associated dependent graptolites range through about 150 feet of strata. It is purposed to show forms typical of the species, some of its transients and related types and to describe the progressive structural changes that have taken place in these dependent forms.

7. H. H. BRADFIELD (Texas Co., Fort Worth, Tex.): New Texas Fusulinidae.

A discussion, illustrated by slides, of four new species of *Fusulina* and six new species of *Triticites*. For comparison several previously described species, mostly from new localities, are illustrated, and the stratigraphic significance and field occurrence are discussed.

8. H. H. BRADFIELD (Texas Co., Fort Worth, Tex.): Notes on Fusuline Morphology.

Illustrations are presented showing the nature of the fibers in the *Fusulina* wall, and the relation of form ratio to tunnel angle in a species.

9. CHARLES E. DECKER (University of Oklahoma, Norman, Okla.): A Pneumatocyst on the Synrhabdosomes of Monograptus (Linograptus) Phillipsi Multiramosus From the Henryhouse Shale (Silurian) of Oklahoma.

Various synrhabdosomes of this species will be illustrated to show what is believed to demonstrate the presence of the pneumatocyst on these forms. This is thought by the writer to be the first evidence produced to indicate that monograptid types were provided with a pneumatocyst.

10. CHARLES E. DECKER (University of Oklahoma, Norman, Okla.): A Eurypterid From the Wellington Shale (Lower Permian) Near Red Rock, Okla. By title.

A cephalothorax of a eurypterid was discovered with a typical Permian assemblage of plant fossils near Red Rock, Okla. It approaches closely a Silurian form from the Manlius limestone of New York, but in the position of the ocellar mound just back of the lateral eyes it is like a Pennsylvanian form from the Coal Measures of Beaver County, Pennsylvania. The eurypterid order ranges from Cambrian to Permian and culminated in the Silurian. Fossils of this order from the Permian are few and far between. Only one other specimen has been reported and that from Portugal.

11. R. C. MOORE (University of Kansas, Lawrence, Kans.) and F. B. PLUMMER (University of Texas, Austin, Tex.): Upper Carboniferous Crinoids From the Morrow Subseries of Arkansas, Oklahoma, and Texas.

12. R. W. HARRIS and DON VIEAUX (University of Oklahoma, Norman, Okla. Introduced by C. E. Decker): Ostracoda Common to the Carboniferous of the British Isles and the Pennsylvanian of Oklahoma.

A comparison is presented between the Ostracode fauna of the British Isles as illustrated by Jones and Kirby and a Pennsylvanian Ostracode fauna from the Arbuckle Mountains of Oklahoma.

13. HUGH ELEY (University of Oklahoma, Norman, Okla. Introduced by C. E. Decker): Paleontology of the Big Bend Region of Brewster County, Texas.

This paper lists the invertebrate fossils of the Big Bend State Park of southern Brewster County, Texas. Of 112 species which are Comanche and Cretaceous in age, there are: 1 crinoid, 7 echinoids, 4 brachiopods, 70 pelecypods, including 9 Exogyras, and 20 gastropods, and 13 cephalopods. The presence of the Exogyras in this region correlates it with the *Exogyras ponderosa* zone of regions farther south in Mexico, and with the Gulf and Atlantic coasts of the United States, a zone which is known to extend about 2,000 miles.

14. J. B. GARRETT (Stanolind Oil & Gas Co., Houston, Tex.): The Hackberry Assemblage—An Interesting Foraminiferal Fauna of Post-Vicksburg Age From Deep Wells in the Gulf Coast.

Attention is called to the presence in the Gulf Coast subsurface of a distinctive foraminiferal fauna overlying the Vicksburg Oligocene and a list of species common in it is provided. The stratigraphic position of the assemblage is indicated by means of a check list. A convenient name is suggested to designate this fauna in the Gulf Coast. The approximate distribution of the fauna is indicated by a paleogeographic map, and four new species are described. Mention is made of the similarity of the assemblage to that of the Alazan, or Huasteca, of Mexico, and to a fauna from Cuba.

15. J. WILLIS STOVALL (University of Oklahoma, Norman, Okla. Introduced by C. E. Decker): Additional Discoveries of Cotylorhynchus Romeri.

Several more or less complete remains of an exceptional Pelycosaur are described from near Norman, Cleveland County, Oklahoma.

16. J. WILLIS STOVALL and WILLIAM McANULTY (University of Oklahoma, Norman, Okla. Introduced by C. E. Decker): A New Pliocene Fish Deposit in Oklahoma.

A rich deposit of small fish, of Pliocene age, belonging to the family of Cryprinidae, recently discovered 5 miles south of Cheyenne, Roger Mills County, Oklahoma, is described. Associated with them were a few frogs, and many fresh-water ostracods, and plant fragments. The sediments consist of a lower layer of dominantly yellow sand about 10 feet thick with an overburden of about 6 feet of coarser sand and gravel.

J. Willis Stovall

17. J. WILLIS STOVALL and DON E. SAVAGE (University of Oklahoma, Norman, Okla. Introduced by C. E. Decker): Recent Discoveries of Phytosaurs on the Cimarron River, Union County, New Mexico.

A Dockum phytosaur from the Triassic of Union County, New Mexico, is described. Its importance in correlating certain "red beds" beneath the Exeter (Jurassic) along the Cimarron River in Cimarron County, Oklahoma, is considered.

18. STANLEY G. WISSLER (Union Oil Co. of California, Compton, Calif): The Application of Numerical Abundance and Faunal Assemblage for Subsurface Correlation.

The Tertiary formations of California are measured in thousands rather than hundreds of feet. Foraminifera are abundant throughout the column, but most species have extensive vertical range, many of them occurring throughout one or more formations. Local paleontologists first attempted to use the principle of first occurrence for well correlation. By this method it was normally impossible to do more than recognize the formation represented. Since the aver-

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age California well penetrates only two or three formations, it was necessary to develop a method by means of which accurate correlations could be made within the formations. By applying the principle of relative numerical abundance and faunal assemblage and sequence to long ranging species, the author has been able to establish a great number of marker zones and horizons. For example, the Repetto formation (Lower Pliocene of the Los Angeles Basin) has been subdivided into 10 zones with 75 subzones and horizons. By means of this routine, well correlations, accurate to the foot, are made. Minor variations in faunal sequence and abundance are such that further subdivision is not only readily possible, but in many cases limited only by the fact that each sample used normally represents a 3-foot interval. Similar zones have been established for all of the marine formations present in the chief oil-producing areas of California.

PALEONTOLOGY AND MINERALOGY DIVISION

THURSDAY, MARCH 17

RAYMOND T. CLOUD. The Energy and Amplitude of Reflected Seismic Waves.

The experimentally determined calibration of seismic recording instruments is used to obtain the amplitude of surface motion resulting from the arrival of a typical reflection. Assuming the validity of conventional ray theory, the history of the amplitude of the reflected wave is followed back to the vicinity of the source. The amplitude of the initiating wave is then arrived at by two independent methods, one theoretical, and one experimental, and found to be of the same order of magnitude as that deduced on the basis of ray theory. It is concluded that there is no foundation for distrust of ray theory in the interpretation of the data of dip shooting. A short discussion of the energy involved in a reflected wave is offered.

ROLAND F. BEERS. A Problem in Seismic Depth Calculation.

In geologic provinces where surface erosion has removed several hundred feet of section, the customary method of depth calculation for the reflection seismograph with an empirically determined velocity function frequently fails to show true subsurface relief. Seismograph structure maps frequently show evidences of the surface topography and intervals between two reflection horizons may appear in excess of the true value. A method is presented here which seems to eliminate the effect of topography on the depth calculations.

PAUL F. HAWLEY. Transients in Electrical Prospecting.

Oscillograms will be shown of the build-up of current which occurs when a potential is suddenly applied between two grounded stakes at separations ranging from 1,000 to 12,000 feet, and of the potential transient between the inner electrodes of a Wenner configuration. These oscillograms were made by focusing the spot of a cathode ray oscillograph on ultra-speed, post-sensitized film, moving at velocities ranging to 250 inches per second.

CURTIS H. JOHNSON. Steady State Polar Sensitivity Curves.

The equation for the resultant amplitude of the steady state summation of n detector outputs as a function of angle of wave arrival is derived and polar sensitivity curves drawn for groups of from 2 to 10 detectors. The effects of wave-lengths and detector spacing are also illustrated.

DUNFORD KELLY. A Reaction Type Steady State Shaking Table.

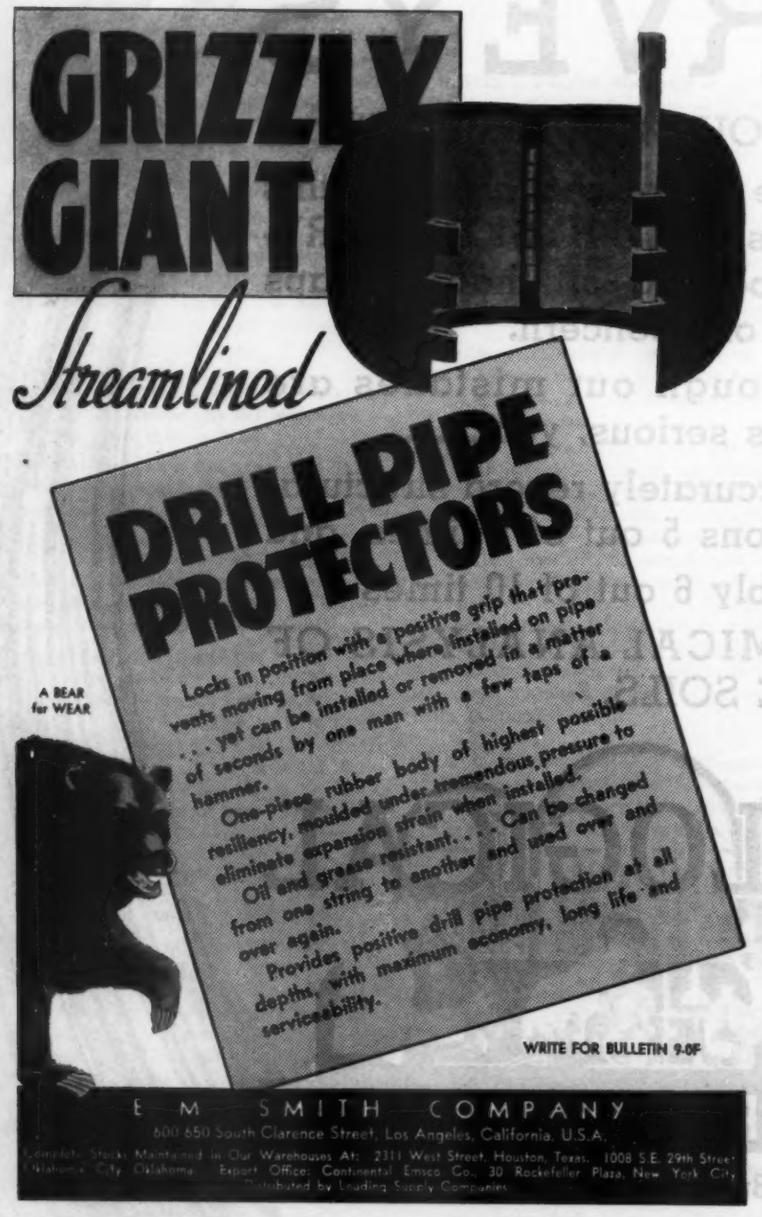
A steady state shaking table utilizing the principle of reaction has been constructed for the measurement of the response of seismometers and the overall response of seismographic apparatus. A mass of 500 pounds is driven at amplitudes of the order of 10^{-4} inches by a small eccentric mass which is rotated at the center of percussion of a bar, the upper end of which is pivoted to the bottom of the heavy mass. The amplitude of motion of the table top is independent of frequency between 10 cycles per second and an undetermined upper limit higher than 150 cycles per second. The construction and characteristics of the table will be illustrated by slides.

REED LAWLOR. Chart for Dip Computations.

A universal chart to be used in seismographing with three-dimensional control is presented. This chart can be used for computing the dip components in and perpendicular to the wave travel plane. By a simple change of scales it can be adapted to all shot distances, detector intervals, and all wave velocities which are functions of wave travel time only. Principles underlying the construction of the chart are given.

MORTON MOTT-SMITH. On Seismic Paths and Velocity-Time Relations.

Most of the simple mathematical curves that have so far been used for the velocity-depth relation cannot be fitted to any observed velocity at all, and are therefore quite useless from a practical standpoint. The main point of this paper is the direct derivation of the path equations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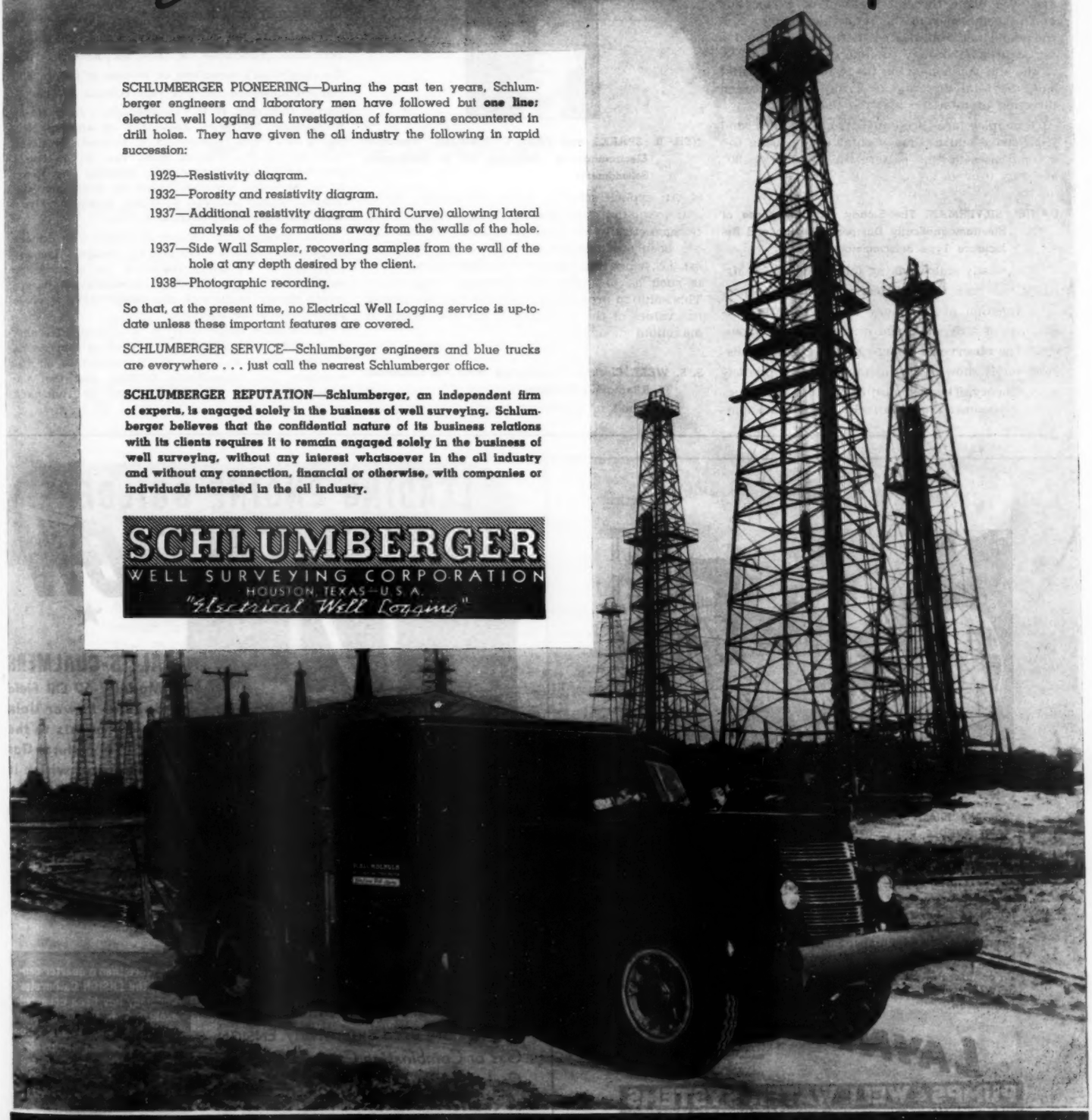

AN INDEPENDENT ORGANIZATION OF CONSULTING ENGINEERS

from the velocity-time relation, rather than from the velocity-depth relation, as has hitherto been the practice.

S. M. ROCK. Three Dimensional Reflection Control.

A method is presented in which two straight-line detector groups, B feet in length, intersect on the line of exploration a distance A from the shotpoint. Group 1 makes an angle sigma with the line of exploration and yields $\triangle T_1$. Group 2 makes an angle β with Groups 1 and yields $\triangle T_2$.

Assuming a) plane wave fronts at the detectors, and b) rectilinear wave propagation, formulas are obtained for: 1. Ψ, the angle of arrival of the reflected wave, in the wave-travel plane (i.e., the plane through the line of exploration and perpendicular to the reflecting plane); 2. θ, the angle between the wave-travel plane and a vertical plane through the line of exploration; 3. α, the dip component in the wave-travel plane; 4. δ, the total dip; and 5. ρ, the angle between direction of total dip and the line.

Examples are presented from profiles and from strike and dip maps obtained by using the special cases of this pattern, in which $\beta = 90°$ and $\delta = 0$ or 45°.

DANIEL SILVERMAN. The Steady State Response of Electromagnetically Damped Dynamic and Reluctance Type Seismometers.

The steady state shaking table devised by Mr. Kelly has been used to determine the response, as a function of frequency and terminating resistance, of a dynamic and a reluctance seismometer. The observed response of the dynamic seismometer is shown to be identical to that predicted by theory. The response curves for the reluctance seismometer qualitatively substantiate analytical predictions as to the value of terminating resistance for maximum damping, and of the shift, with decreasing resistance, of the peak of response to higher frequencies. A short discussion of the electrical equivalent seismometer will be given, and a comparison shown between the experimentally determined response of a reluctance type seismometer and that of its equivalent network.

H. KLAUS. An Introduction to the Second Derivative Contour Method of Interpreting Torsion Balance Data.

NEIL R. SPARKS and PAUL F. HAWLEY. Maximum Electromagnetic Damping of a Reluctance Seismometer.

An explicit solution to the third order differential equation representing the action of an electromagnetically damped reluctance seismometer has been obtained for the case of greatest interest, i.e., when the value of terminating resistance is such as to make the damping a maximum. This solution provides useful interrelations among the values of the constants of the instrument at maximum damping.

S. S. WEST. Electrical Prospecting With Non-Sinusoidal Alternating Currents.

A method of electrical prospecting using alternating current of rectangular or other non-sinusoidal wave form is described. The change in wave form caused by subsurface structure is determined by a null method in which the detected electromotive force is balanced against an electromotive force produced by passing the output of a standard oscillator through an adjustable network. This process of measurement (applicable also to the transient method) makes possible a useful representation of the data in terms of two-dimensional contours.

I.P.A.A. Names Its Committee On Supply and Demand

Charles F. Roeser, president of the Independent Petroleum Association of America, announce that the association's committee on balance of supply with demand appointed for this year consists of the following: Chairman, H. B. Fell, executive vice president, Independent Petroleum Association of America, Ardmore, Okla.; vice chairman, J. S. Bridwell, president, Bridwell Oil Co., Wichita Falls, Tex.; C. M. Boggs, president, Kanotex Refining Co., Arkansas City, Kans.; E. B. Shawver, president, Shawver Petroleum Co., Wichita, Kans.; and Van S. Welch, president, Flynn, Welch & Yates, Inc., Artesia, N. Mex.

The committee on balance of supply with demand cooperates with the Interstate Oil Compact Commission, the oil regulatory bodies of the oil-producing states, and all the state and governmental departments having to do with the conservation of crude petroleum and its products.

Mr. Roeser stated there is a subcommittee that works under the committee on balance of supply with demand that is known as the Subcommittee on Unnecessary and Unprofitable Drilling, and that the personnel of this subcommittee will be announced in the near future.

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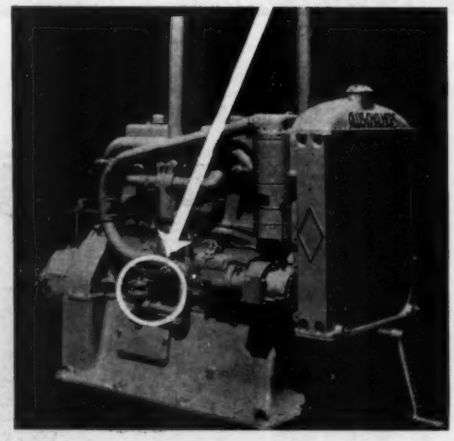

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In This Issue

FLOODING AND BRINE DISPOSAL METHODS USED IN MID-CONTINENT
By Paul Reed ..... *Page 84*

Although areas where water-floods are under way are separated from those in which disposal of brine by injection into underground reservoirs is practiced, the two have several points in common. Here the author discusses both types of injection, as followed in the Mid-Continent, and compares them with Pennsylvania field practice.

HIGHER GASOLINE YIELD OBTAINED IN REVAMPED CRACKING UNIT
By D. H. Stormont ..... *Page 90*

Barnsdall Refining Corp. recently completed revamping of cracking facilities at its Barnsdall, Okla., plant and as a result is now obtaining a yield of 57 per cent 72 plus octane gasoline. Both light and heavy oil cracking are employed and steam requirements have been greatly reduced by extensive use of reflux oils and heat exchanging.

PIPE LINES LAID IN MARSH PROTECTED BY CATHODIC CIRCUIT
By Neil Williams ..... *Page 93*

A project involving the laying of seven lines through a salt water marsh is being carried out by Gulf Refining Co. near Port Arthur, Tex. To reduce corrosion troubles at this point, cathodic protection is being applied. The seven lines are tied together at each of the 12 cathodic protective units, which are placed one-quarter mile apart.

USE OF CORRECT WELL COMPLETION METHOD IMPORTANT AT LISBON
By George Weber ..... *Page 96*

Operators in the Lisbon field of North Louisiana are studying well completion methods to determine which provides the best oil recovery. The problem is complicated by variations in producing formation characteristics and fluctuations in producing schedules.

SQUEEZE CEMENTING FOR CONTROLLING GAS-OIL RATIOS OF WELLS
By C. P. Parsons ..... *Page 103*

Squeeze cementing has proven to be great assistance for the purpose of shutting off water or for reducing gas-oil ratios. Various types of jobs, such as squeezing cement in open formations, cementing casing and liners, and selective perforating and squeezing are discussed.

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QUESTIONS ON TECHNOLOGY—*By C. K. Francis, Ph.D.* ..... *Page 106*

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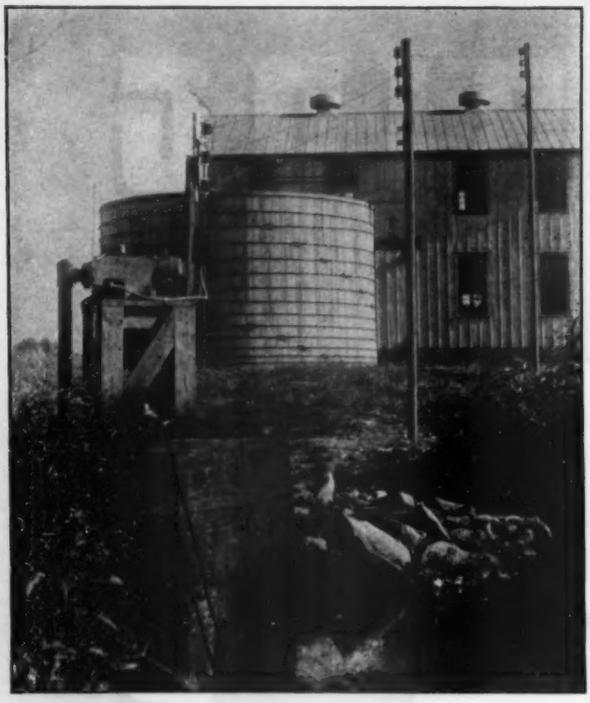


Filter plant on a flood project in Northeast Oklahoma

Water-Flooding Methods Used

By PAUL REED

Since the injection of water or brine into wells is being practiced in water-flooding and brine disposal, a consideration of these two applications together offers a chance to outline the methods for meeting the problems of each and to indicate ways in which they may be related. Water-flooding is undertaken as a profitable method of producing oil; water disposal is a means of getting rid of a troublesome waste product.

There are special reasons for discussing injection in Oklahoma and Kansas because the principal extension of water-flooding in recent years has taken place in northeastern Oklahoma and southeastern Kansas; also because brine disposal by injection into wells may be regarded as a western Kansas development which has had an influence in Oklahoma and Texas. Areas where flooding is in progress are distinctly separated from those where disposal of brine by injection is a common oil-field practice. Therefore, injection for these two purposes has, on the whole, come under the direction of separate groups of engineers, handling their problems for the most part solely with regard to what confronted them in their own particular phase of water injection.

Both types of injection have a common problem in the treatment of water or brine for the purpose of putting it into such a condition that no deposits will form in the injection well to plug the limestone and sandstone formations. The injection of water underground runs into problems peculiar to itself. In handling this subject, consideration will first be given to water-flooding, with particular reference to the following aspects: what has been accomplished in recent years; the extent of present operations; some of the methods for dealing with conditions in the producing formations; water supply, and treatment. Next, water-disposal practices will be outlined as they are followed in western Kansas.

In the ensuing discussion of these two phases of injection it will be seen that the search for cheap and effective water treatment has led to the adoption of several different methods. In regard to these there is a variety of opinions, and it appears that treating for injection has been passing through an experimental stage, in the course of which different hypotheses have been tested. In the test of time, the superiority of certain procedures will become manifest, and as a result, there may be an increasing tendency toward standardization of methods for handling identical problems. The material presented has been obtained on field trips to the points where such operations are being carried on. It is intended that a bird's-eye view of the subject be given for those who have not been in touch with these operations, in order that future development may be watched with more interest.

Water-flooding as a method of producing oil has only a limited application today, since it is confined on the whole to certain localities. However, it is steadily being further applied, and it holds promise of becoming a technique of growing importance to the industry. The present technique is that of the five-spot method, which has proved to be effective in Pennsylvania during the last 10 years. This is the outgrowth of experience with various methods of flooding in the previous decade, the principal one being the line flood, in various forms. The past two decades of systematic flooding in Pennsylvania were anteceded by numerous surreptitious experiments with flooding, which are reported to have been carried on as far back as the nineties, and earlier.

Early Brine Disposal Activities

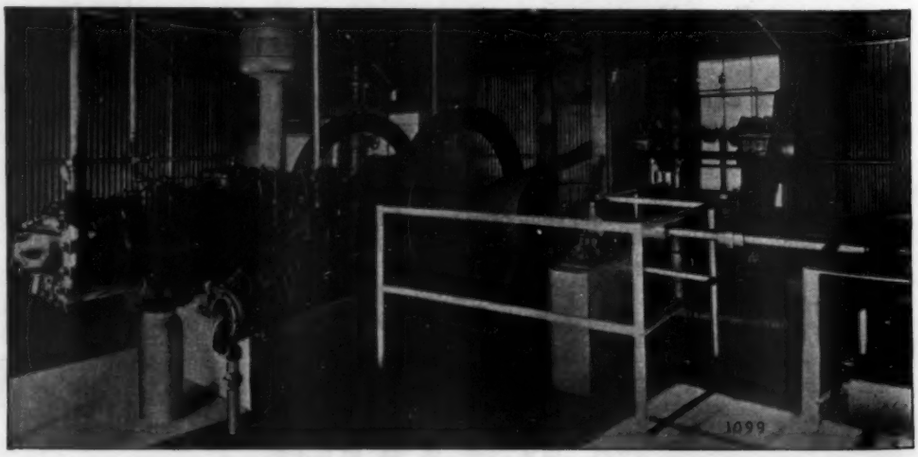
In those days it was widely believed that the entrance of water into oil-bearing formations brought only harmful results. Laws were passed against it, and cases are recalled today of oil producers being jailed for putting water into wells. However, oil men here and there were observing increases in production in the vicinity of wells which were known to be letting water into producing formations through leaky casing. As a result there was some secret experimenting with casing ripping, notably in Pennsylvania and certain parts of Kansas, with such impressive effect that in the course of time steps were taken to remove legal restrictions and open the way to the development of water-flooding as a legitimate procedure.

The only areas where water-flooding is being practiced to a conspicuous extent are the Bradford district in Pennsylvania, the Nowata field in Oklahoma, and certain counties in southeastern Kansas. In addition to flooding in these sections, activity is carried on in the Bird Creek field north of Tulsa, at certain points in Texas and Louisiana, and flooding experiments have been conducted on the coast of South America where sea water has been let into wells drilled along the shore.

Types of Well Patterns

Systematic flooding started with line flooding about two decades ago. There were different ways of applying this method, but in general it may be said to consist of drilling a row of wells closely spaced, at or near the boundary line of the property. Water was injected into these wells to force the oil into wells in the interior part of the property. As flooding progressed, another row of wells would be drilled on staggered locations, and this was repeated until the property was supposed to be flooded out. Strange as it may seem, it is hard to find one of these so-called flooded-out properties which has actually been abandoned. Flooded-out properties have frequently been reflooded profitably.

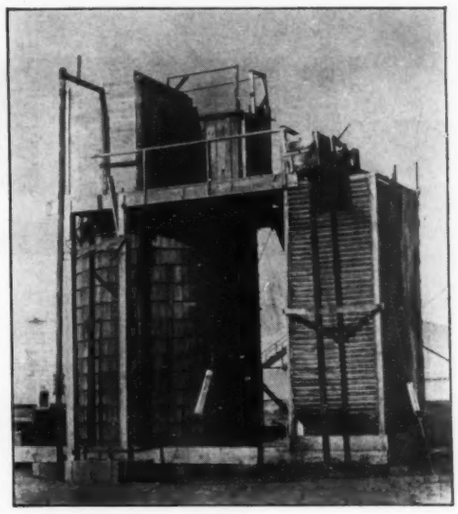
The five-spot method, which superseded the line flood, derives its name from the five spots on dice. When a property is drilled up for water-flooding by this method, each oil well is surrounded by four wells into which water is injected. In drilling a property for five-spotting, water intake wells are drilled at regular intervals over the entire property to be flooded, with an oil well in the center of each of the squares formed by the water-



Water-flood pumping plant in Nowata field, Oklahoma

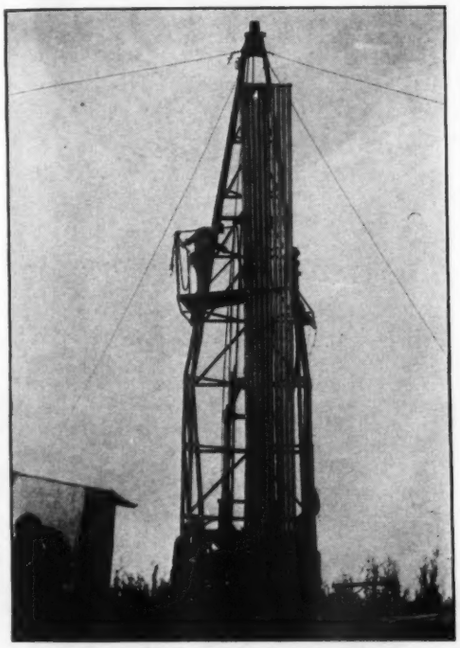
Resume with additions to paper presented by author before joint meeting of Oklahoma Society of Professional Engineers and American Society of Civil Engineers at Tulsa, January 21, 1938.

and Brine Disposal in Mid-Continent



Salt water disposal plant of the accelator type in use on a Kansas project

intake well pattern. In flooding in Kansas and Oklahoma, the interval between water wells and between oil wells is usually 330 feet; however, sometimes intervals of 440 and 220 feet are used.



Light rotary drilling on a flood project

Both of these spacings are well adapted to the 40-acre land divisions of this country.

In undertaking a flooding operation, some operators prefer to proceed by what is known as delayed flooding. In doing this, all old wells on the property are plugged and all water and oil wells used in connection with flooding are new wells. With delayed flooding, oil wells are not drilled into the sand until several weeks or months after the injection of water into the wells has started. The advocates of delayed flooding assert that it gives a larger yield, owing to the greater uniformity of pressure conditions which can be obtained, caused by a more widespread diffusion of water.

The principal worries of the water-flooder are connected with the channeling of water through the sand to the oil well so that it by-passes oil in the pores of the sand which it is intended to remove. Those who do not practice delayed flooding usually make a point of plugging only those wells which interfere with their well pattern. In Pennsylvania there has been a distinct difference of opinion as to whether delayed flooding should be practiced, but in the Mid-Continent operations there seems to be a definite trend toward using it more extensively.

So far, water-flooding has been discussed as a method of secondary recovery applied in an old oil field when production has declined to a point where it is reaching its economic limit under ordinary pumping conditions. However, at two widely separated projects in Kansas, water-flooding is now being applied as a means of primary recovery in shallow pools where there is not sufficient reservoir energy, owing to the absence of gas or water pressure, to move the oil.

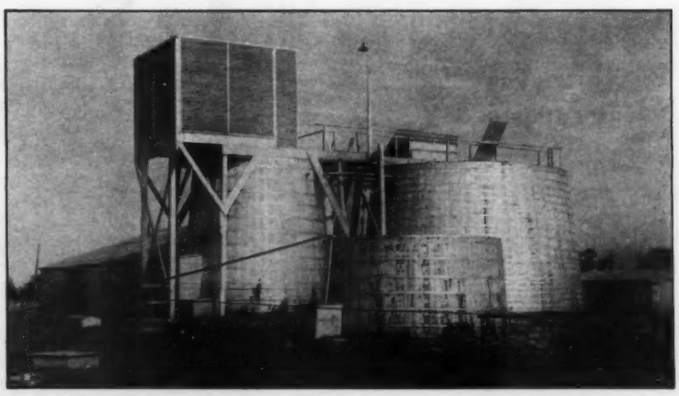
Conditions existing in the water-flooded areas of Pennsylvania and the Mid-Continent differ to such a marked extent in some respects that a number of Bradford operators have been skeptical about the chances for ultimate success in the Mid-Continent flooding operations. The Mid-Continent operators, however, have managed to continue to increase their production and expand their operations showing that favorable aspects can be made to compensate for unfavorable ones.

Basic Flooding Requirements

In comparing the two areas, certain advantages and disadvantages offset each other. To begin with, the first things that water-flooders are concerned with are reservoir conditions existing in the sand body; the basic conditions demanded being a thick body of sand characterized by uniformity of permeability. In both areas these two requirements are met, but all other factors differ. Formations flooded in Pennsylvania are characterized by low permeabilities; permeabilities between 5 and 10 millidarcys are not uncommon. A permeability of 25, which is considered high in Pennsylvania, is fairly low for Mid-Continent flooding, where there is often an average of 50, with higher permeabilities running considerably over 100. In the Mid-Continent it is claimed that there is less oil in place per acre-foot. However, it is asserted by some that a higher percentage of what oil is there is recoverable by flooding, but it is also said that with higher permeabilities there is more susceptibility to channeling.

In the Mid-Continent the cost of drilling wells is low, owing to the fact that present water-flooding in the area is mostly carried on in fields which are less than 600 feet deep. In Pennsylvania the water-flooded producing horizon is nearly three times as deep. There is an abundance of clear water suitable for flooding in Pennsylvania, and the problems of filtering and treating do not assume the importance which they do in the Mid-Continent, where a large amount of flooding water is drawn from muddy streams which at times become supersaturated with calcium carbonate. Furthermore, Pennsylvania producers sell their oil for more than twice the price received in the Mid-Continent.

There are indications that flooding costs are likely to be steadily reduced as the result of improvements which have been tested in the field during the past year. And it appears that Mid-Continent flooding operators are making important changes in the technique brought from Pennsylvania, so that not only lower costs but also higher yields may be obtainable. Already one of the largest operators in Mid-Continent flooding has demonstrated that flooded oil wells may be successfully flowed. Another large operator is testing the advantages of several innovations which include a preliminary injection of gas into the property during the months immediately preceding water-flooding. This operator is also testing the advantages to be had through controlling the rate of production by means of electric motor-driven jacks. Since the biggest cost of flooding is the original investment in the drilling of wells for flooding purposes, attention is being directed to the development of equipment which will make it possible to drill a large number of shallow wells more cheaply than they can be now. Experiments are being conducted on some water-flood properties with multiple packers for the purpose of controlling the flow conditions within the sand. In addition to the increased efficiency possible from these innovations, there is the chance that some of the experimental work being done with solvents will aid in more effectively removing oil from the sand grains and materially increase the per acre yield to be expected.



Treating plant at Oklahoma flood project

The water supplies of the Mid-Continent flooding areas can be increased to take care of growing requirements when the present method for obtaining water are found to be inadequate. In the Nowata area, water is supplied by the Verdigris River, Big Creek, shallow gravel beds, and small

(Continued on Page 88)

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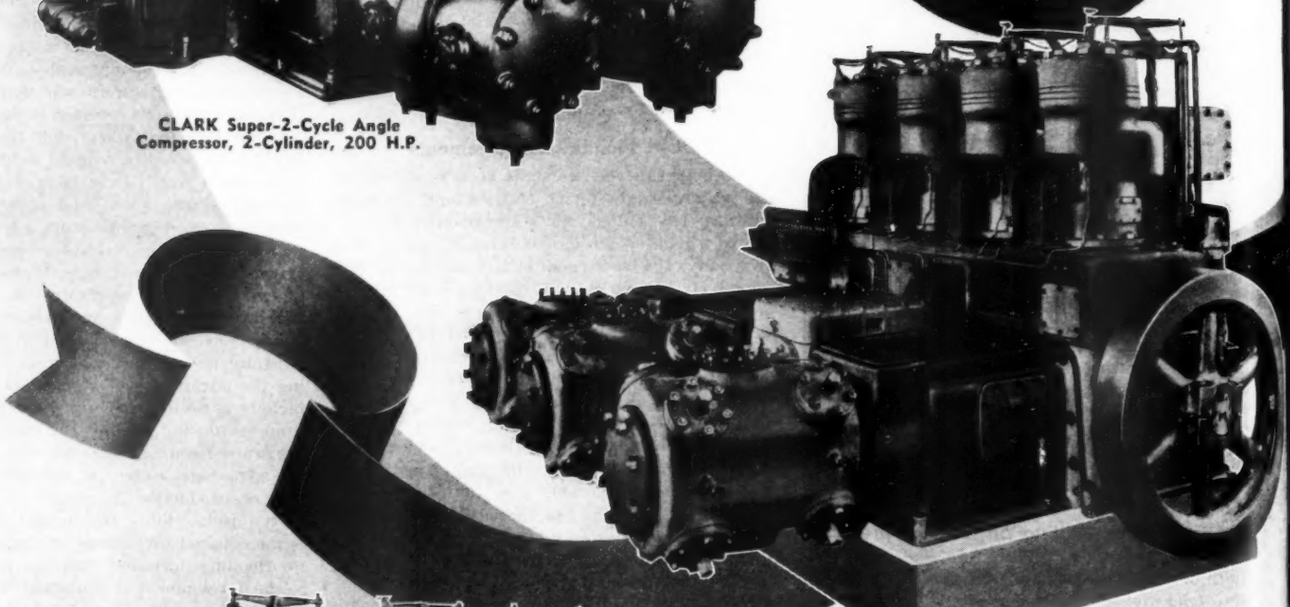

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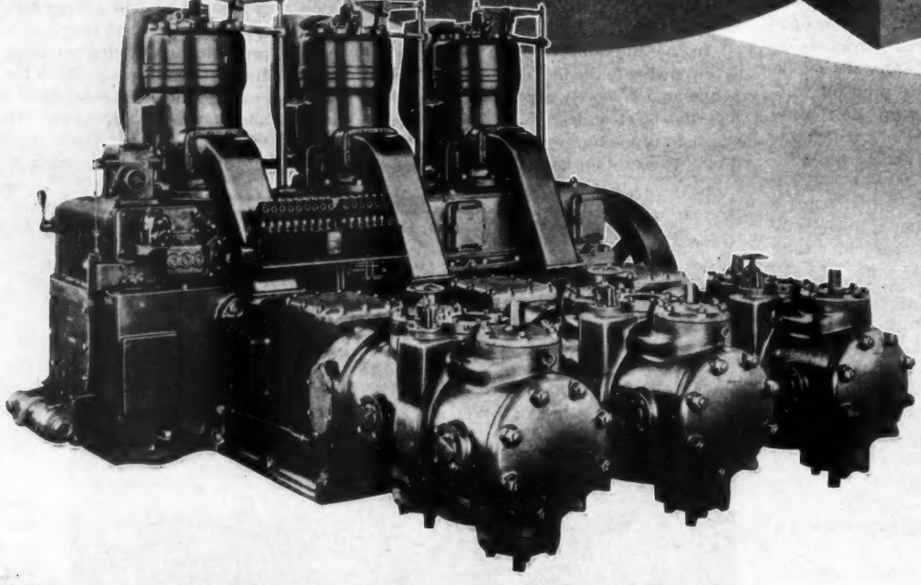

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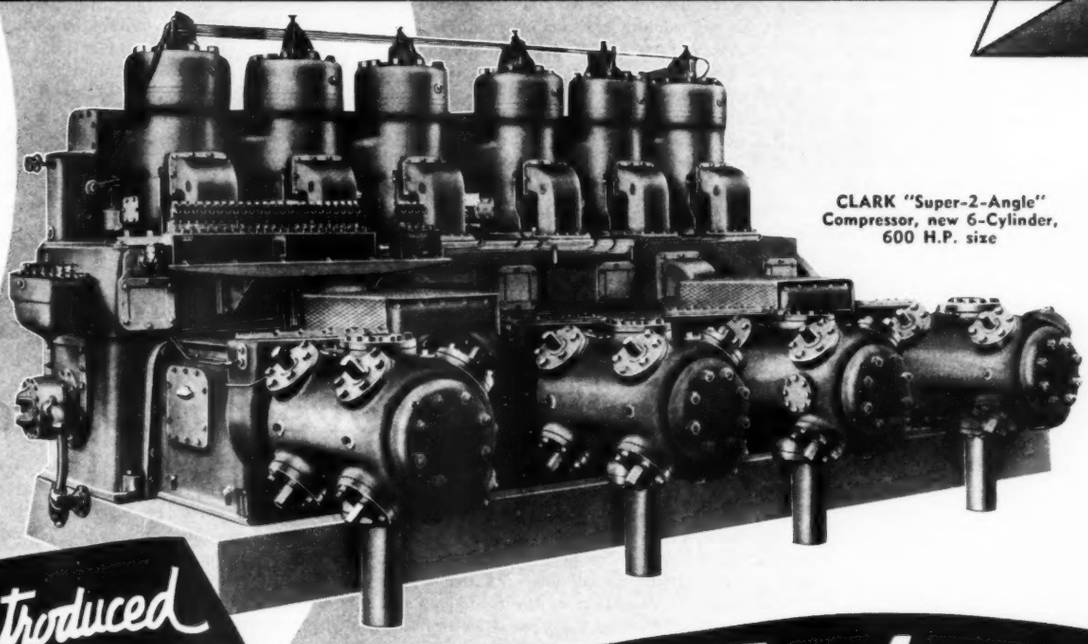

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reservoirs. A study of the area by W. R. Holway, hydraulic engineer, has shown that an ample future supply can be had from a reservoir formed by the damming of Big Creek north of the producing territory. A project for furnishing over 200,000 bbls. per day of filtered and treated water is considered by him to be practicable. Water supplies for flooding in Kansas are obtained by damming small creeks and by using brine from underground formations.

The use of brine has proved to be successful. There is reason to believe that its use will be extended, especially after the results recently obtained in treating hydrogen sulfide brines in western Kansas become better known. Such treatment will make available for flooding the large supplies of brines of this kind obtainable from the Ordovician lime. The use of such brines has promise even though an early attempt at treatment was unsuccessful in the Nowata field. Mid-Continent flooders have no aversion to using brine produced with the oil for recycling in the ground for flooding purposes.

The preparation of water or brine for flooding in the Oklahoma-Kansas area is done either by coagulation with alum (or sodium aluminate) and lime treatment in connection with conventional sand and gravel filters; or it is handled by a method known as the accelator system which provides for aeration, stabilization, clarification, and pressure filtering. The first accelator plant, to be put in operation, was installed in the Nowata field. With certain modifications this method has been applied successfully to the treatment of brines at disposal projects in western Kansas.

The place where troubles due to plugging of water input wells are most acute is where brine injection is resorted to as a means of disposal in the oil fields of western Kansas. This plugging trouble referred to occurs where water is injected into the usual lime and sand formations and is not encountered where an operator is fortunate enough to have a disposal well in formations of a cavernous or sink-hole character.

Brine Disposal

Disposal of brine by injection into underground formations has been practiced to a greater extent in Kansas than in any other section because the state and the oil companies have made a special effort to work together to protect fresh water supplies from contamination by oil field wastes. In a number of states it has been permissible to have oil field brines flow into streams during periods of high water, provided that this were done with proper cencentration control. In western Kansas where large quantities of brine are produced with the oil from a siliceous limestone formation it has been considered necessary to take special precautions in disposal because there are often long periods in which there is little rain and because geological conditions render fresh water supplies particularly susceptible to contamination.

Much brine has been impounded for disposal by the former method, but in a number of cases this has proved to be unsatisfactory and injection has been resorted to. For injection, a dry hole can frequently be found to serve as an injection well but there are many instances where oil companies have drilled wells solely for disposal purposes. Most brine injected underground goes into the Siliceous lime or the Reagan or basal sand just below it. In the course of disposing of brine in this way it was soon found that a well, which would take brine readily at first, would gradually lose its capacity for receiving it. The company would be faced with the necessity of cleaning out the well at an expense of something more than $700. But after cleaning it has been frequently observed that the well has not been restored to its original capacity for receiving brine owing, it is believed, to the probability that the material deposited in the well is forced back into the pores of the limestone or sandstone formations during the process of cleaning out.

In order to meet this situation steps have been taken by certain companies to provide a means of preparing brine for underground injection in order that there may not be any deposits formed in the well which will plug the formation. Deposits in disposal wells consist largely of iron oxide and calcium carbonate. To eliminate these deposits, a type of filter plant was constructed which is now commonly referred to as the closed system, since an effort was made to exclude air. During the past year there has been some experimenting with open systems, providing aeration by coke tray aerator or blower preceding the settling taking place in an open pit before filtration. A third type of plant is the accelator which has previously been referred to in connection with water-flooding.

This type of plant subjects the brine to a series of treatments consisting of aeration and stabilization; and a second aeration, stabilization and clarification before the final filtration in a closed filter. It is asserted that brine leaving the plant is a clean product, free from hydrogen sulfide, and stabilized as to its carbonate constituents. Results obtained in recent months indicate that it is adapted to treating hydrogen sulfide brines in localities where it may be desirable to use them for water-flooding purposes. Results obtained at these western Kansas brine disposal plants during the past year will be analyzed in a bulletin of the U. S. Bureau of Mines to be published at an early date. Past experience indicates the findings of this report will have considerable influence on the trend of brine treating practices in the coming year.

Dummy Rings Used to Repair Piston Grooves in Diesel

An unusual cause of power loss developed in a pair of high-speed diesels driving, through speed increasers, the centrifugal pumps in a West Texas pipe line station. Since compression tests, against closed valves, indicated loss or leakage past the rings and the condition of the crankcase oil corroborated this finding, the pistons were pulled and new rings installed, without taking time out for more than a brief visual inspection of the pistons.

Again on the line, the engines handled their load for only a short time before trouble appeared. The conditions duplicated those causing the earlier shutdown, and a careful "miking" followed the dismantling. The ring diameter checked closely with manufacturer's specifications, and the cylinder bore was well within tolerance for roundness. Not until the ring grooves in the aluminum pistons were checked did the cause of power loss become apparent. The fit between groove and ring was much greater than the maximum allowable, with, as the pistons were of aluminum, this clearance increasing appreciably as the piston expanded both ways away from the cast iron ring. Instead of there being a condition of "blow-by" the engines were suffering from "blow-around," the high-pressure gases of combustion passing *behind* the rings and thus causing power loss.

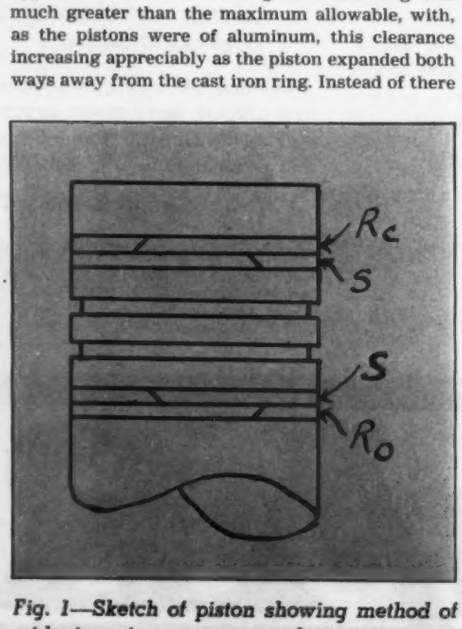


Fig. 1—Sketch of piston showing method of widening ring grooves and inserting non-contacting spacers to provide shoulders for maintaining pressures: Rc—Compression ring. (S)—Spacers. (Ro)—Wiper or oil ring

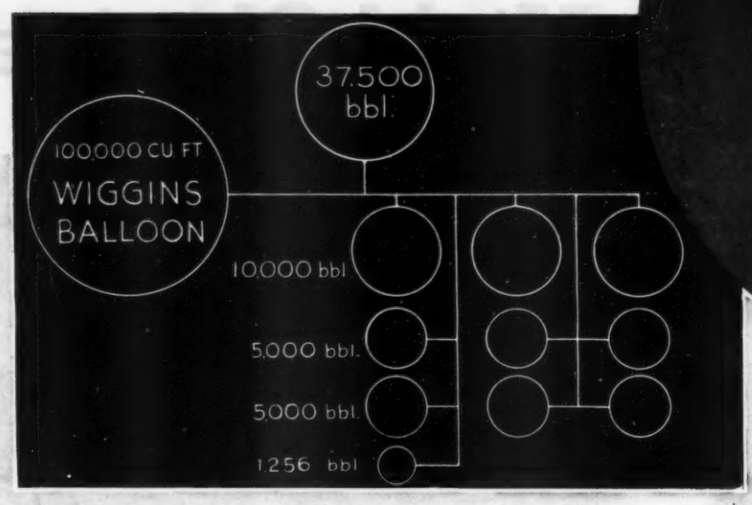
The lands on the pistons were comparatively narrow, to allow four rings to be used above the pin, so there was little but the lip contact between ring and groove to retain the pressure. Due to the closeness of the rings, it was not thought advisable to widen the grooves and use wider rings in an attempt to get around the trouble.

Welding of new edges to the grooves could have been done only with aluminum, the difference in coefficients or rates of expansion between the base metal and any others causing separation of more wear resistant metals, had they been used. To cut down the amount of welding on the piston as much as possible, the two middle grooves were filled with metal by a torch, and then remachined to give grooves of the original width. At the top ring and for the oil wiper ring, however, only machining was done, to keep welding heat and possible failure therefrom away from the piston head and skirt, respectively. These two grooves were widened to twice their original dimension, but wide rings were not used on account of the undesirable wear thus placed upon the cylinder wall, together with the added difficulty of having the wide band of cast iron to follow cylinder contours accurately. The widening of the grooves was such as to remove only the minimum necessary to give perfect ring contact on the sides toward the other rings, the remainder of the metal removed being toward head and skirt, respectively.

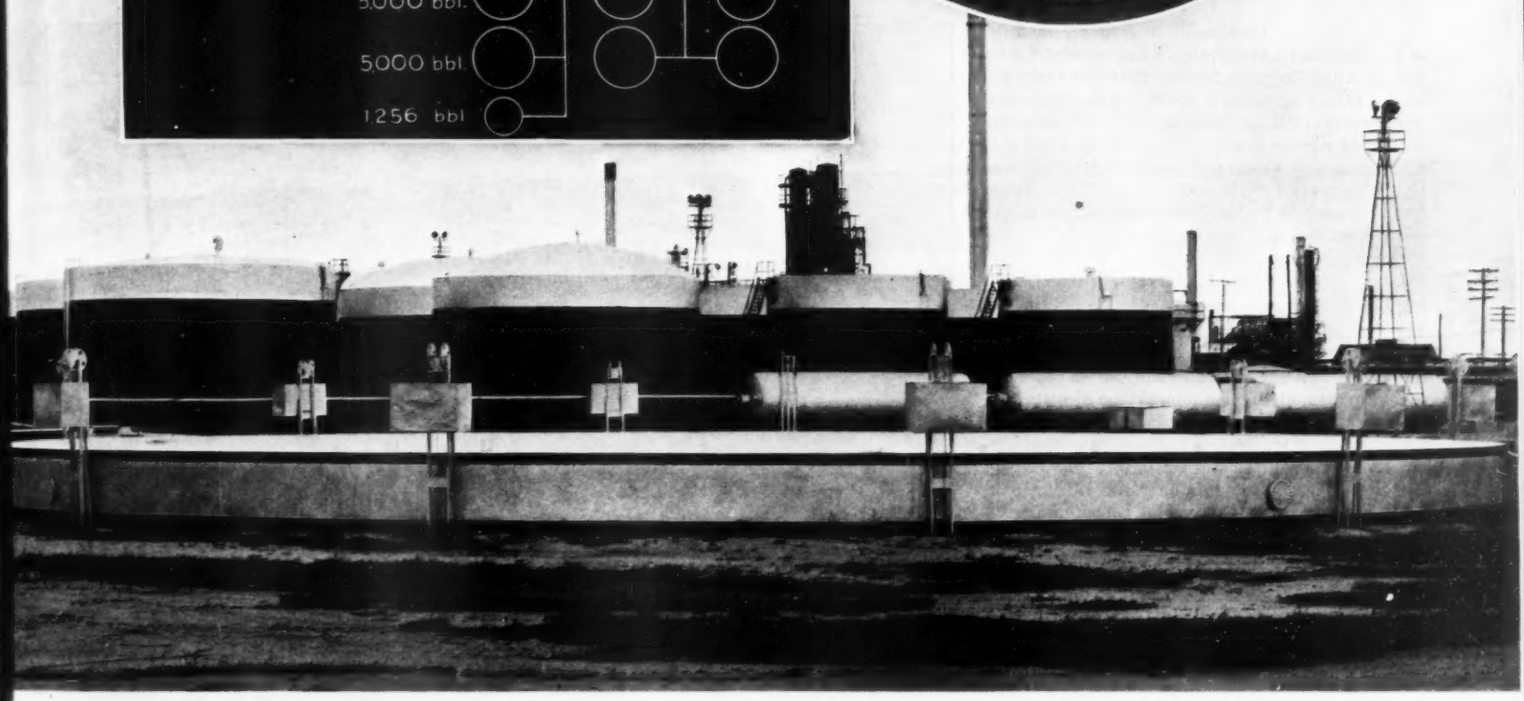
Into these wide grooves were fitted the standard rings, a spacer ring filling the remainder of the groove; this spacer ring, instead of being hammered to expand, was peened on the outside to cause it to contract and hug the piston closely. At the top, the spacer was placed below the compression ring, while the dummy went in above the wiper ring, so as to cut down as much as possible the formation of carbon outside the spacer.

When so placed, the two dummy rings took on the iron-to-iron surfaces of the pair in each groove, most of the side friction which had resulted in the excessive abrasion as originally put out. After reworking the pistons as outlined, the engines carried their usual 15 per cent overload without overhaul shutdowns for months where earlier they had functioned only for weeks without attention.

This Wiggins Balloon is a 100,000 cu. ft. unit used by the Continental Oil Co. at Denver, Colo. The sketch indicates how it is connected to a total of eleven gasoline tanks of various sizes.



UNITED WE SAVE!"



THE time-honored principle of gaining protection by being united finds novel expression in the Wiggins Balloon System for saving vapor. Individually, it is not always feasible to provide protection against vapor loss, particularly for the smaller size tanks. But with group protection provided by a Wiggins Balloon, you can include even the smallest units.

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2. Gives protection against both pumping and breathing losses. In actual operation, the balancing of vapor between tanks being emptied and filled has the effect of increasing the capacity of the system.

3. Adds no additional labor or supervision expense. Users are of the opinion that balloons will have life equal to steel tanks.

4. Permits modernization on a large scale. Any ordinary tank that can be made gas-tight can be used as part of the system.

5. A single system can provide protection for various grades or blends of gasoline. Crude oil tanks, too, can be tied into the same system. The only precaution is to not use the same system for both sour and sweet oils and not to include tanks storing oil products that boil at ordinary atmospheric temperatures.

6. By keeping tanks filled with vapor or gas instead of air, corrosion on the inside of the tanks can be practically eliminated.

7. Protects the quality of the product in a number of ways. The prevention of evaporation loss, of course, prevents loss in gravity. One user reports important savings by preventing dust from being breathed in and discoloring finished gasoline. Absence of air retards gum formation.

8. Encourages discovery of excessive pipeline leakage by reducing the possible major causes for loss down to this one item.

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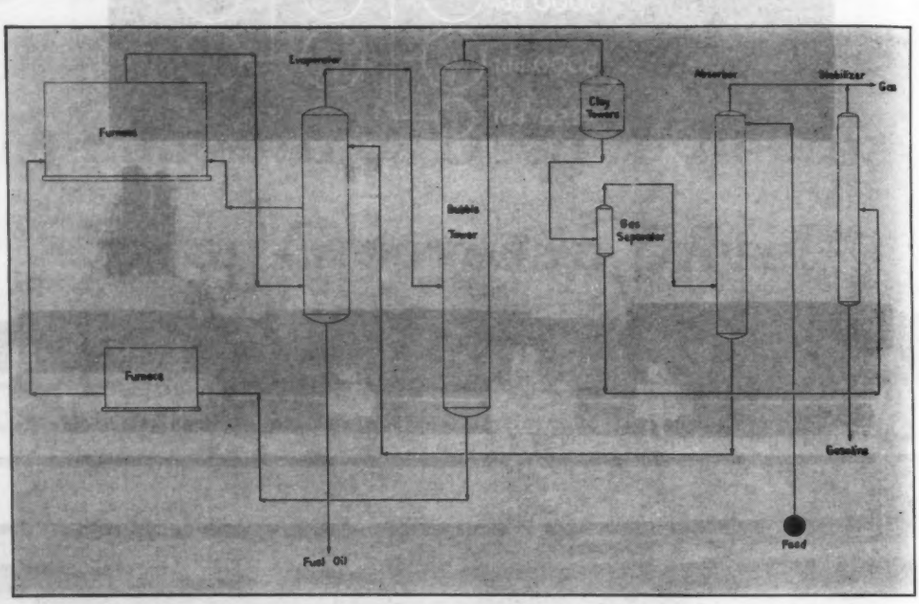
WIGGINS BALLOON SYSTEM

Higher Gasoline Yield Obtained in Revamped Barnsdall Unit

By D. H. STORMONT

Revamping of cracking facilities at its Barnsdall, Okla., refinery has enabled Barnsdall Refining Corp. to increase both the yield and octane rating of gasoline obtained from the cracking operation. Under present operations, approximately 57 per cent of 72 plus octane gasoline (L-3 method) is recovered from a charging stock consisting of topped crude and gas oil. When operating on a straight gas oil, a recovery of over 60 per cent 72-octane gasoline was obtained.

The revamped unit, constructed by M. W. Kellogg Co. and Barnsdall engineers and licensed by Kellogg as a Cross unit, is rated as a 2,700-bbl. per day, two-coil hot oil unit. In general, operation of the unit is conventional, principal features being the use of two furnaces and the use of vapor recovery and stabilizing equipment tied directly into the operation of the cracking unit. The amount of steam required for process purposes has been also greatly reduced since the revamped unit largely uses reflux oils for maintaining and raising temperatures throughout the system. Only three products leave the unit; an endpoint gasoline, a 7-9 degree A.P.I. gravity fuel oil and gas. Control of the stabilizer determines the vapor pressure of the gasoline produced, at present 9.5 pounds, and the quantity of gas going to the fuel lines.



Simplified flow diagram of the two-coil cracking unit

Work done in revamping the unit consisted largely of the construction of a new heater and in remodeling one of the old heaters so that it operates as part of the new unit. The new heater is of conventional Kellogg design and contains two separate coils, a light oil cracking section and a viscosity breaking coil. It contains only one compartment with the cracking section occupying the roof, vertical and floor sections of one-half of the heater and the vis-breaking coil the same sections of the other half. The heavy oil coil also occupies the raised portion of the roof where the hot flue gases exit to the stack. Both units are end-fired, and through proper disposition of tube surfaces a maximum of heat is transferred with a satisfactory degree of temperature control being provided in all sections of the heater.

Charging stock to the new unit has varied from straight gas oil to a mixture of 75 per cent topped crude and 25 per cent gas oil, depending on the amount of each available from the crude units. At present the unit is operating on a charge consisting largely of topped crude and having a gravity of 29-30 degrees A.P.I.

The process flow for the new unit is shown in the accompanying diagram. The charge is picked up from storage and pumped to the top of an absorption tower, operated at about 40 pounds pressure, where it descends countercurrent to uncondensable vapors from the stabilizer. In this manner all the gasoline vapors are extracted from the cracked gases before they are burned as fuel in the heaters. From the bottom of the absorber the charge is pumped through an exchanger, heated by reflux oil from the base of the bubble tower, where it is heated to approximately 350° F. The charge then enters the evaporator, maintained at a pressure of about 50 pounds.

The charge to the viscosity breaker furnace is removed from a tray midway up the column, picked up by the heavy oil charging pump and pumped to the vis-breaker coil of the new heater. A discharge pressure of around 1,100 pounds is maintained on this pump. From the viscosity breaker heater the charge is taken to the base of the evaporator, maintained at a temperature of around 900° F. Fuel oil of 7-9 A.P.I. gravity is taken off the base of the evaporator and run to storage. A gas oil and gasoline cut is taken off at the top of the tower and charged to the bottom of the bubble tower.

The charge to the light oil heater is picked up from the base of the bubble tower by the hot oil charging pump and discharged at a pressure of 1,650 pounds to the light oil heater. The oil passes through a preheater in the furnace, through the light oil coil and then into the cracking coil of the new heater where it is heated to about 960° F. After leaving the cracking coil the oil is quenched, heat exchanged against the light oil charge and transfer, and returned to the evaporator.

Part of the stream taken from the base of the bubble tower, the other part being charged to the light oil heater, is cooled and either recycled to the evaporator or is used to heat the gasoline stabilizer.

(Continued on Page 98)

Barnsdall Refining Corp.'s revamped cracking unit at Barnsdall, Okla.

Pipe Lines Laid in Salt Water Marsh Protected by Cathodic Circuit

By NEIL WILLIAMS

A project involving the application of cathodic protection to seven parallel lines simultaneously is being carried out by Gulf Refining Co. (pipe line division) on a section of its main pipe line system between El Vista station, near Port Acres, and Port Arthur, tidewater terminus of the system, in Jefferson County, Texas Gulf Coast. The section is only 2.75 miles long, but, with the seven lines which comprise the trunk system at this point, a total of about 19.25 miles of pipe is being protected. Making up the seven lines are four 10-inch, and three 8-inch lines, spread out a width of approximately 25 feet. Some sections of the pipe are bare and some coated.

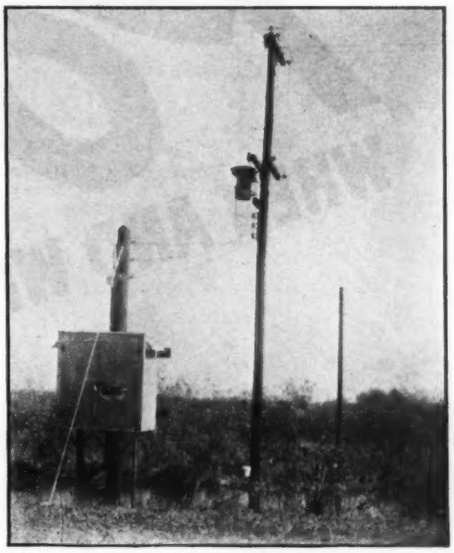
Corrosion has been a constant source of trouble on this section of line, which is through a salt marsh regarded as one of the "hottest" spots on the company's entire pipe line system. So rapid and extensive has been corrosive action that the company has found it necessary to recondition thoroughly all pipe on this section at least once every five years. Because of the number of lines and other factors, current requirements for protection of pipe on this section are relatively high for the length of the section. It is necessary to deliver enough current to bring the minimum potential up to 0.8 volt (copper sulfate reference electrode). To facilitate effective and uniform protection, and to lighten the load at any one point, current delivery to the line is made at 12 points spaced at quarter-mile intervals.

Current is transmitted by a 2,200-volt, three-phase power line. Pole transformers located at the quarter-mile intervals along the line transform the current from 2,200 volts down to 20 volts. Delivery to the line is through Rectox units, which convert the alternating current to direct current. Each unit delivers to the line 100 amperes at 10 volts, except one of the end units which delivers only 50 amperes. The circuit resistance at each unit approximates 0.10 ohm.

Unlike most installations of this kind, taps for changes in the voltage step-down are located in the pole transformers. Normally, taps are located in the Rectox unit house with a second transformer being provided. In an installation of the latter type, the pole transformer serves to step the high voltage current down to around 110 volts, the current then being transformed down to the desired voltage in the second transformer. Although the location of the taps in the transformer on the power line pole is not as convenient as it would be in the Rectox unit house, which is readily accessible from the ground, it eliminates the necessity of the second transformer, an important saving in initial investment.

Installing Ground Beds

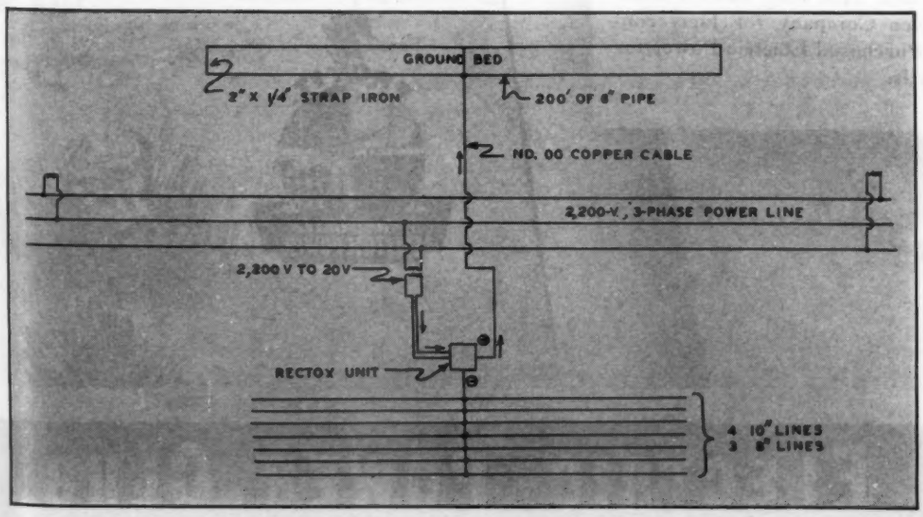
The seven lines of the pipe line system are bonded together at each of the Rectox unit connections. This is done with a section of 2-inch pipe laid across the top of the lines and welded to them. To this pipe the negative side of the Rectox unit is connected with a copper cable. From the positive side of each unit a No. 00 copper cable leads to a ground bed. The ground beds are located 100 feet from the closest of the seven lines being protected, or about 125 feet from the farthest line. Each consists of two 200-foot sections of 6-inch pipe laid parallel to each other 10 feet apart, and also parallel to the pipe lines. The two sections are connected at the ends and at the center points with 2-inch by one-half inch strap iron, welded in place, and forming a single ground unit. Each is buried 30 inches deep in the ground.



Rectox unit and pole transformer installation on Gulf Refining Co.'s pipe line

To balance the load requirements of the power line for so many current delivery units, the transformer takeoffs are staggered with the three phases of the line. For instance, each third takeoff is from the first and second phases of the line; the next takeoffs in order are from the second and third phases, and the remainder from the first and third phases.

Prior to the application of protection to this section of line, detailed studies were made of pipe potentials, soil resistivity and other factors involved. Minimum pipe potentials at this time were in the order of 0.3-0.5 volt (copper sulfate reference electrode). Soil resistivity was determined at 400 ohm-cm.



Sketch of the cathodic protection installation

Rendel Heads Committee On Motor Fuel Research

T. B. Rendel, of Shell Petroleum Corp., has been named chairman, and R. P. Anderson, secretary, division of refining, American Petroleum Institute, has been named secretary of the Institute's 1938 Committee on Motor Fuel Research. The announcement of these appointments was made by N. E. Loomis, chairman of the Central Committee on Refinery Technology. The committee follows:

D. P. Barnard, Standard Oil Co. (Indiana); A. E. Becker, Standard Oil Development Co.; H. W. Camp, Cities Service Oil Co.; A. Ludlow Clayden, Sun Oil Co.; T. G. Delbridge, Atlantic Refining Co.; Graham Edgar, Ethyl Gasoline Corp.; E. W. Isom, Sinclair Refining Co.; J. R. MacGregor, Standard Oil Co. of California; K. G. Mackenzie, Texas Co.; J. T. McCoy, Tide Water Associated Oil Co.; Walter Miller, Continental Oil Co.; C. C. Moore, Jr., Union Oil Co.; G. G. Oberfell, Phillips Petroleum Co.; J. B. Rather, Socony-Vacuum Oil Co., Inc.; Herschel G. Smith, Gulf Oil Corp.; G. R. Taylor, McColl-Frontenac Oil Co., Ltd., and C. R. Wagner, Pure Oil Co.

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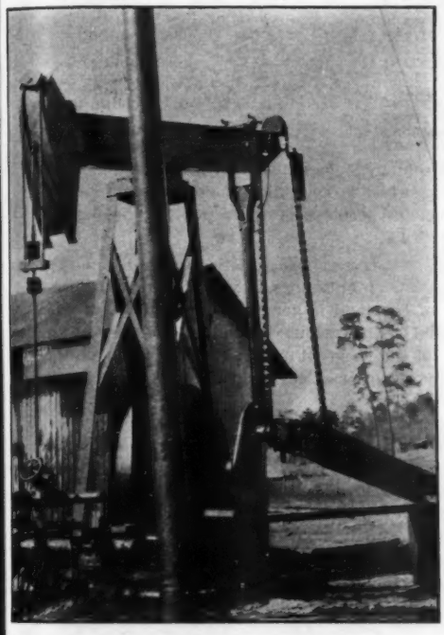
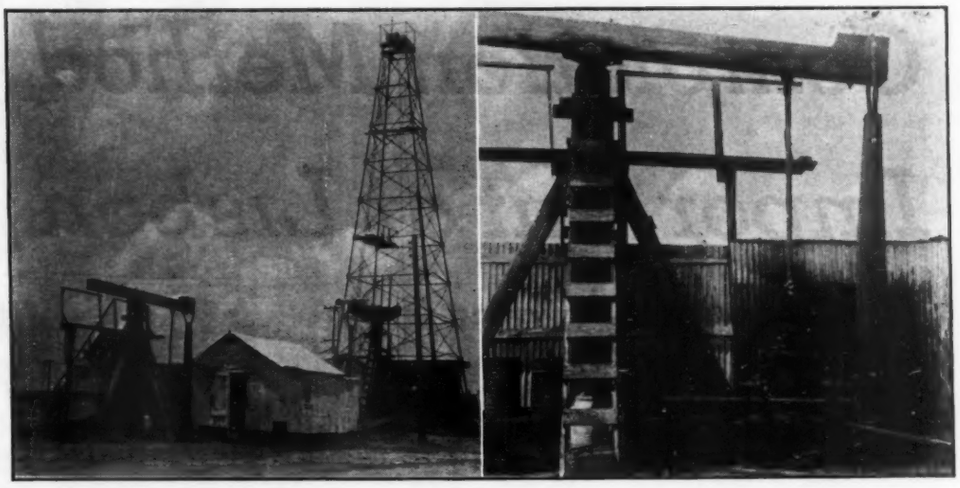
OPERATING IDEAS

Chain as Counterbalance Link

One use to which old worn-out drilling chains may be placed is shown in the accompanying photograph; using them to hookup pumping beams and their counterbalances. This installation, on a lease at Overton, Tex.,



makes use of the chain to replace the conventional secondary pitman for connecting the heavy timber counterweight to the power end of the pump beam. Being practically a continuous joint or bearing, the chain linkage requires no lubrication and may be adjusted simply by taking up one or more chain links on the hook attached to beam.

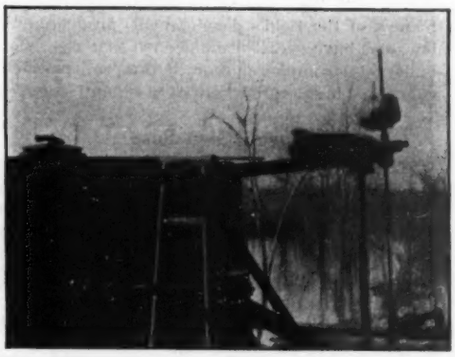


Two Walking-Beams Used on Unusual Well Hookup

A well with two walking-beams is being operated with an unusual hookup in the Eldorado, Kans., field. Originally the vacuum pump was operated by a connecting rod actuated by the beam used in pumping the well, but it was found that in pulling the desired vacuum it was necessary to pump at a faster rate than was practicable for the oil well. Therefore, a smaller walking-beam was placed in the rear of the power which might be called a "pup" or "mizzen." This small walking-beam is actuated by means of a pitman connected by a crank with a pulley which is belt-driven by the engine. Power is transmitted from this small walking-beam to the vacuum pump by a connecting rod. The vacuum pump is operated at the rate of 55 strokes per minute to pull between 22 and 24 points of vacuum. The oil well is pumped at the rate of 22 to 23 strokes per minute and produces from 20 feet of open hole at a depth of 2,616 feet. It has been in production for a number of years.

Central Pumping Unit

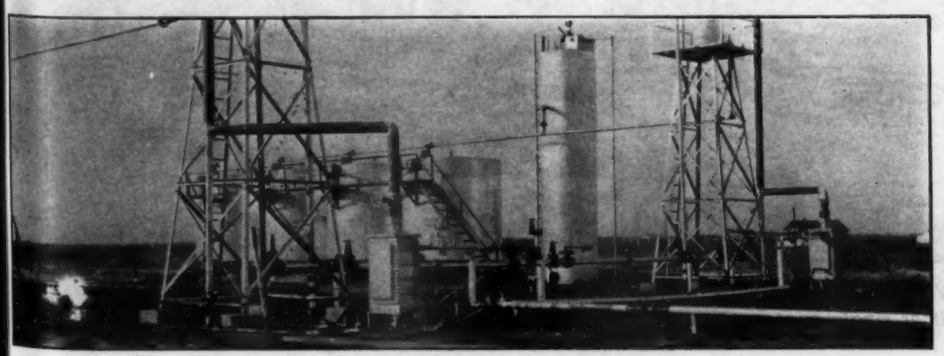
A pumping unit operated from a central power is being used by one Pennsylvania oil company to transfer oil from the lowest point on the lease to stock tanks. The receiving tank is set at the lowest point on the lease to allow water to separate from the oil. A joint of casing with the lower end welded shut is set in a hole bored in the earth and on the casing is placed a regular head. A



standard working barrel with valves is placed inside the casing and operated by the ordinary pumping jack. A 2-inch connection from the tank to the casing supplies the oil to be pumped, the water having already separated. In this way only oil is delivered to the stock tanks, and any danger of its freezing in cold weather is eliminated. This installation is in the Bradford field.

Gasoline Condensers on Oil and Gas Separator

In the K.M.A. field near Wichita Falls, Tex., one large operator has installed condensers on the gas line from the separator to a natural gasoline plant. As it is necessary to heat the crude oil for treating, the company is able to pick up a larger volume of casinghead gasoline, later to be extracted at the gasoline plant, by the use of these condensers. Two condensers operating at one tank battery are shown in the accompanying photograph.



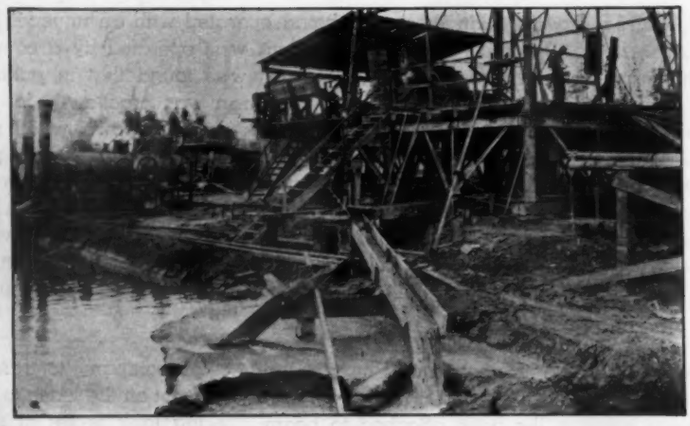
Use of Correct Well Completion Method Important at Lisbon

By GEORGE WEBER

The object of considerable study by operators in the Lisbon field of North Louisiana is the method of well completion which will provide the best possible oil recovery. The completion problem is complicated by a wide variation in characteristics of the field producing formation, and in addition, by fluctuation in producing schedules over a long period of time.

A major extension was recently added on the southwest limits of Lisbon, opening what may prove to be the most productive section of the field, and past experience gained in a year of operations will greatly aid in the development of the new area for highest ultimate returns.

Lisbon now numbers over 170 producers, nearly every one presenting an individual case with regard to completion procedure. The producing lime formation varies in porosity and permeability without any definite uniformity throughout the field. Furthermore, during the history of the field's development, production allowables have greatly changed, so that wells now undergoing completion require different treatment from comparable producers of six months ago.



An important step in completing wells is to swab thoroughly before cleaning, and then to circulate water until it runs clear

Lower Glen Rose

The Lower Glen Rose formation, which produces at Lisbon, consists of alternating shales and limestones, several of the latter having high porosity and carrying salt water. Although no well has yet been drilled through the Lower Glen Rose in the field proper, it is estimated to extend at least 100 feet below the top of the present producing horizon, and some tests have cored as much as 1,000 feet of the formation.

The producing section of the Lower Glen Rose at Lisbon is confined thus far to what is termed the Pettit sand; a very soft, highly porous, mealy oolitic limestone, occurring with somewhat harder coquina type lime, also porous. Hard fractured limestone with sparsely distributed solution cavities is present in varying amounts over the field.

In chemical composition the producing lime is nearly pure, dissolving readily in acid, and leaving a minute amount of residue; considerably simplifying the problems of acid treating. The average thickness of the porous pay is 12½ feet, but it ranges from 1½ feet to as much as 21 feet in the best wells of the field. The most common sections cored in the field, however, average 8 to 14 feet in thickness.

Generally, the thinnest net pay occurs on the west edge of the field, where producing lime ranges from 1½ to 5 feet in thickness. Along the north edge the lime runs 5 to 6 feet and shows tighter characteristics than average. In the field proper, it may be said that the main portion of the net pay gradually increases from west to east, but the new development on the southwest sector shows promise of producing some of the best wells in the field. In fact some of the largest initial production gauges have been made on tests in that area.

Porosity of the oolitic lime ranges from 25 to 35 per cent; the coquina from 20 to 30 per cent and the hard lime from 10 to 12 per cent. Although the friability of the limestone samples prevents recovery of good cores, and therefore precludes obtaining good representative laboratory tests, the oolitic lime is assumed to have the highest permeability.

Time Logs Used

Time logs are successfully employed in the field by some operators, the different formations showing up clearly in drilling the formation. The following time log is an example of results, taken at constant pump and drilling pressure:

Section (feet)	Time (minutes)	Type lime
5,272-73	7	oolitic
5,272-74	2½	oolitic
5,272-75	3	oolitic
5,272-76	7	oolitic
5,272-77	9½	coquina
5,272-78	6	oolitic
5,272-79	7	oolitic
5,272-80	5	oolitic
5,272-81	8	oolitic
5,272-82	11	coquina
5,272-83	12½	coquina
5,272-84	5	oolitic
5,272-85	18½	hard
5,272-86	23	hard
5,272-87	16	hard

Although it does not always follow, the faster drilling time is an indication of greater porosity as well as softness of formation, as checked by electric logs.

As the above characteristics indicate, the type of pay which operators may expect to find in any part of the field is generally unpredictable. This, coupled with various individual policies on the part of the several producers, contributes to a wide range of practices in completing Lisbon wells.

Casing Records Vary

With the exception of the oil string, casing records in the field are much the same. A 9⅝-inch or 10¾-inch surface casing is set at depths ranging from 700 to 1,000 feet, using from 300 to 600 sacks of cement. The average oil string, either 5½-inch, 17-pound or 7-inch 22-26-pound pipe, is set at 5,250 feet, cemented with 250-500 sacks and tested to 1,250 pounds according to regulations. From this point, however, methods vary widely. Some operators set the oil string on top of the pay and rathole into the section. Others core the pay, ream and set casing above.

The presence of a shale break, which occurs as thick as 6 feet in some wells, requires still different practice. In sections of that type, some of the wells were completed through perforations in the oil string which was set through both pay streaks on bottom. Two producers have casing set on the

Well acidizing takes an important part in completion of Lisbon wells. Use of acid in either single or stage treatment increases production and flowing life of wells many fold, and adds to the ultimate recovery

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shale break, flowing through perforations in the upper pay and open hole in the lower sand. Some operators have set atop both pays, leaving the two oil sections and the shale break open. The latter practice is not followed generally, however, as it leads to difficulty due to caving of the shale after acid treatment.

Swabbing Time

The swabbing time of Lisbon wells has been greatly increased, as operators gained more experience in improved completion methods. In the early history of the field, the hole was cleaned and acidized after a short swabbing period, which in many cases failed to bring any natural flow before treatment. The present tests, however, are given a thorough swabbing, ranging up to three days in some instances. Good operating practice has also brought about the necessity of completely cleaning the hole before acidizing; wells are washed down with water until returns run clear and water is then thoroughly swabbed out before beginning acid treat.

Aside from a few exceptions, all Lisbon wells are acidized upon completion; some tests requiring only one shot, others taking treatment in stages, and some employing the use of a jelly seal. In preparing the wells for acidizing, the following is an example of a procedure found successful:

1. Core through pay and drill 40-foot pocket below section.
2. Set casing through pay with plug approximately 10 feet off bottom, giving a 30-foot pocket.
3. Perforate entire pay section.
4. Wash down with oil, and circulate until hole is clean.
5. Swab until well flows or live oil from formation shows.

In washing down with oil, the oil is introduced through the annular space between casing and tubing; riding down with a level interface and forcing the mud out through the tubing, and thus preventing the channeling which often occurs when reverse flow is employed. The procedure of setting pipe through pay and perforating is not representative of the majority of the wells in Lisbon, but it is considered a good engineering practice.

Acidizing

Acidizing jobs at Lisbon vary according to the quality of the pay in each well. Usually one stage is all that is required, and on an average 1,000 gallons of acid are used for each 3 feet of exposed oil pay in the hole, giving requirements a range of from 3,000 to 6,000 gallons.

Due to the presence of porous streaks, and also to the purity of the lime and consequent speed of reaction, the acid usually siphons into the well on a vacuum as soon as it strikes the formation. A certain amount of such acidizing is beneficial, as it causes opening of the porous streak over a wide area around the hole. However, in some cases where one porous streak is getting all the acid and the remaining tighter oil pay is not being touched, stage acidizing has been used with success.

An example of the success with stage acidizing at Lisbon is seen in the treating of Sloan & Zook's No. 1 Patton. The well, after perforating and thoroughly cleaning, made about 60 bbls. per day before acidizing. The initial stage consisted of 750 gallons of acid, followed by 12½ bbls. of oil to fill the tubing. When the acid reached bottom, casing was closed and the acid went into the formation on an 18-inch vacuum. After 26½ bbls. more of oil were pumped in, the pressure built up to 500 pounds and the well was shut in for one hour. The hole was then swabbed clean and refilled with oil, and followed with 18 bbls. of acid pumped in with no bleed off.

At this point 50 gallons of jelly seal were introduced and followed by 30 bbls. of acid. Pressure then built up to 250 pounds, being kept low to prevent acid from bypassing the jelly seal on the porous streak and reentering it from the tighter section. After being shut in for an hour the hole was cleaned, and the well came in making 80 bbls. per hour on open tubing with a working pressure of 250 pounds and a casing pressure of 2,000 pounds.

Another example of increasing production by use of acid and jelly seal was the work done on the Lyons & Neely No. 1 Patton. After being completed in April, 1937, the well's production declined steadily, until by December it was dead. In this case the jelly seal was introduced first, 50 gallons being pumped in at 100 pounds to seal off the more porous sections. Acid followed, first going in on vacuum and then building up to a pressure of 600 pounds before breaking back to vacuum. After 3,500 gallons had been pumped into the lime the test was shut in for an hour, then reversed and swabbed. Production was gauged at 90 bbls. per hour.

Acidizing Abandoned well

Still a third use of acid at Lisbon was successful in making a producer out of a test which had been abandoned as dry: the Lisbon Oil Co. No. 1 Burgess. The test cored very tight lime, and although oil had shown on swabbing, the well would not make a commercial producer, and had been abandoned.

Going back into the hole, operators circulated oil through casing for 10 minutes and then started the 5,000-gallon acid stage. Pressure built up from 200 pounds, at which point the casing was closed, to a high of 1,800 pounds. The pressure rise was not uniform, decreasing several times as acid entered more porous streaks in the formation. At the end of the acid treatment pressure stood at 1,800 pounds and would have built up higher but for control on pumps, due to light casing, and a bad joint at the well connection. The well was completed for a producer.

Proration a Factor

Under the present allowable set for the field, wells are producing on an average of 60 bbls. per day, as compared with an average production of over 170 bbls. last September, when allowables and pipe line purchases were at a maximum. At that time all wells were acidized upon completion to assure full allowed production.

With lower production schedules, however, several of the most recently completed wells will easily make their allowables without the need of treatment. Thus acidizing is postponed until some future date when production drops, or more generous proration is in effect. With construction now under way on a new pipe line outlet to the field, it is expected that the Louisiana Department of Conservation will grant Lisbon producers a higher allowable. If this increase materializes it will probably bring about a number of acidizing jobs for wells which at present will produce their allowable but could not meet a higher production demand.

Since Lisbon is primarily a pumping field, and a majority of wells now producing will be on the pump shortly, the allowable will also have an effect. At present 39 wells are rigged up to pump, many requiring only occasional agitation to flow their daily allowable.

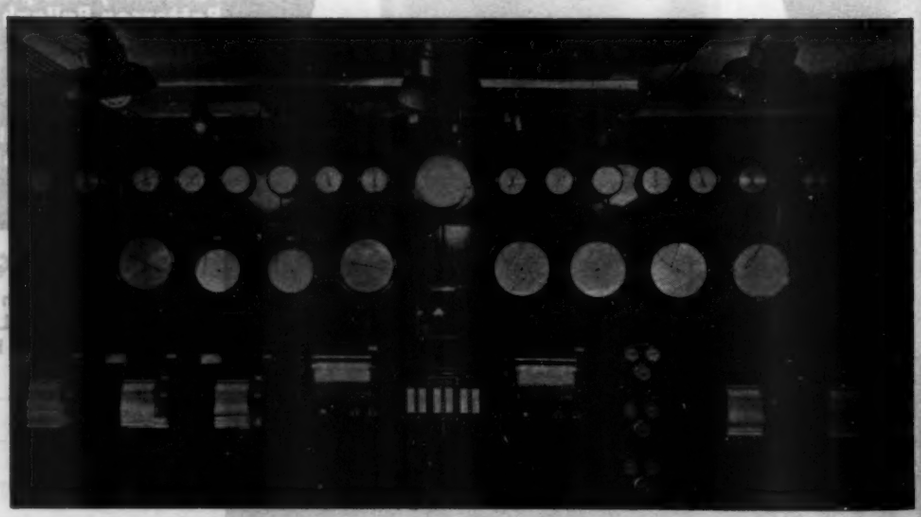
BARNSDALL UNIT

(Continued from Page 90)

A portion of the recycle is also used as quench oil for the light oil stream from the cracking coil.

Unstabilized gasoline is taken off the top of the bubble tower and passed through Grey vapor-phase treating towers. The gasoline is then condensed and run to a gas separator where the light ends are allowed to separate from the gasoline. It is then charged to the stabilizer, at present held at a pressure of about 100 pounds. Heat for fractionating the gasoline is supplied by a stream of recycle stock from the base of the bubble tower, the base of the stabilizer being held at a temperature of about 290° F. As operated at present, a finished gasoline of 58-59 A.P.I. gravity, 9.5 pounds Reid vapor pressure is being taken off at the base of the stabilizer. Vapors leaving the stabilizer are used as fuel after passing through the absorption tower.

As much of the old equipment as was possible was used in the revamped unit. All old recording equipment was incorporated in the new unit, but new controllers were used throughout. Both the light oil and heavy oil pumps were also installed. The light oil pump, a 4½ by 24 Wilson Snyder duplex, is direct connected to a 11½ by 13½ Cooper-Bessemer gas engine rated at 400 hp. at 400 r.p.m. The heavy oil charging pump is direct connected to a 12½ by 15 gas engine, rated at 110 hp. at 250 r.p.m. Both pumps are separated from their prime movers by fire walls to reduce the danger of fire.



Control panel in Barnsdall's remodeled cracking plant

NO WET-NURSE NEEDED!

One of the five 44-horsepower "Caterpillar" Diesel Engines pumping for the Shell Petroleum Corp. on their lease near Sulphur Springs, Texas

On their lease near Sulphur Springs, Texas, the Shell Petroleum Corp. has learned that when you give a job to a "Caterpillar" Diesel Engine *you can forget all about it!*

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That's the kind of economy and dependability engineered into a "Caterpillar" Diesel Engine! Simple in design, yet sturdy in construction, it will do everything you'll ever ask, including steady operation—24 hours a day, if and when you want it.

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Progress in METALS

By W. L. NELSON

Metallurgical Terms

Cyaniding

One of the methods of obtaining a hard wear-resistant surface on bolts, nuts, keys, pins, gears, shafts, rotors, etc., is to carburize the surface by dipping the part into a molten bath of potassium cyanide. The carbon content of the surface is increased and by suitable quenching and tempering operations, a tough, hard, wear-resistant skin of high-carbon steel can be produced.

The depth of carbon penetration is not as great by cyaniding as by other carburizing and case-hardening methods, but the simplicity of the process makes it a desirable method for metal products that do not require a thick case and which are inexpensive. Since cyanides are highly poisonous, the baths of liquid cyanide must be kept under a hood having a strong draft and the workman must wear gloves so that the poison cannot get into scratches or cuts.

A simple but less used method is to sprinkle powdered cyanide salts on the metal part and then heat at 1,500-1,600° F.

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The effect of molybdenum as an agent for increasing the creep strength of steels is forcefully evident in Figure 1. (A) is a comparison of steels with and without molybdenum. Note that molybdenum always seems to improve the creep strength, although most effectively in the more simple steels. Chromium seems to increase the creep strength up to about 1.25 per cent when used with molybdenum but at higher percentages it is not advantageous from a creep strength standpoint unless an exceedingly large amount is used such as 18 per cent.

Even at high percentages of chromium the addition of molybdenum aids creep strength. This is evident in (B) which shows plain 18-8 chrome nickel steel and a 16-13 chrome nickel steel containing 2.5 per cent of molybdenum. The strengths given in (B) are among the highest ever reported for any type steel.

Molybdenum does not improve the resistance to high temperature oxidation and hence the plain moly-carbon steels are frequently calorized. (C) indicates the creep strengths of moly-carbon steels at 1,300° F. and the molybdenum contents up to 1.5 per cent.

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More and more attention is being given to special alloys for condenser tubes for corrosive conditions. Copper nickel alloys containing 20 to 30 per cent of nickel have been in service for several years and are superior to brass tubes except in cost. More recently an alloy containing 78 to 80 per cent of nickel, 12 to 14 per cent of chromium and 6 to 8 per cent of iron, called inconel, is being considered. Robert C. Stanley of the International Nickel Co. says:

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Obviously the use of such alloys depends upon economic considerations involving a balancing of material cost against superior corrosion resistance.

Performance of Oil-Well Pumps Lined With Chromium

A novel use for a metal relatively new to the industry is being developed in connection with the pumping of oil wells and in pumping the mud-laden fluid circulated in the operation of rotary drilling. The method is analogous to the surfacing of bits and tools with a hard-facing material, although the process is different. The pistons and cylinders of such pumps are subject to severe abrasion and corrosion. The application of chromium to these wearing parts has been found to materially lengthen their life in service. Supply companies serving the oil trade are offering for sale deep-well pumps so processed under the trade name "Cro-Lay." Chromium is very hard, hence abrasive-resistant, and is inert or passive to many of the corrosive chemicals present in oil and in salt water which so often accompanies crude oil. Chromium has also a low coefficient of friction, so "Cro-Lay" tends to cause pumps to run lighter and use less power. Cup or packed plunger deep-well pumps run longer without redressing when used with Cro-Lay barrels. There is less friction on the very smooth chromium surface.

The following performance reports of "Cro-Lay" in deep-well pumps were taken from the publication, "Between Calls":*

District—	Length of service (days) Cro-Lay	Plain	Ratio of service	Notes
Arkansas	233	83	2.82	Smackover crude
Graham, Texas	150	20-30	6.0	2,600-ft. well
Daisetta, Texas	420	70	6.0	Gulf Coast
Bristow, Okla.	75	20	3.75	Replaced in well because of excellent condition
Seminole, Okla.	37	6	6.2	75% brine—25% oil
Borger, Texas	300+	175	1.71+	Still in service

The cost of Cro-Lay tubes is obviously a function of the length and size of tube, type of pump, etc., nevertheless, a good average cost is $2.85 per foot of tube processed by the Cro-Lay method. At least one supply company is meeting with success in the distribution of "Cro-Lay" liners for mud-hog pumps. No service records are available for Cro-Lay mud-hog liners, but the vendor reports of Rodessa contractors that "they come back for more so they must be pleased."

*Published monthly by Walter O'Bannon Co.

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Conclusive evidence of the conclusions of the Texas Co. metallurgical department regarding the value of various tube materials for the particular water conditions in this refinery, is evident in the following tabulation of the kinds of tubes in service since 1930.

	Percentage of various tubes in service 1930	1933	1936	Approx. cost, based on steel as unity
Steel	18 0	16 3	12 0	1 0
Stainless steel	60 3	14 9	5 6	4 8
Admiralty metal and other copper-base alloys	21 7	68 8	82 4	1 2

These figures are doubly notable because they are a record of data on more than 1,000 tube bundles containing over 500,000 tubes and for equipments used in all types of refinery service.

Scattered data on specific services are summarized in Table 1.

TABLE 1—LENGTH OF SERVICE OF VARIOUS STEELS

Service—	Material 1	Material 2	Months of service: Plain steel	4-6 chrome 0.5 moly steel	18-8 nickel steel	Admiralty metal
Oil to oil	Crude oil, 135° F.	Residue stock, 600° F.	72 or more	..	..	..
Oil to water	Water, 125° F.	Cycle oil, 300-550° F.	6	..	..	15
Oil to water	Water, 100° F.	Naphtha, 200-300° F.	3–8	..	..	12–24
Vapor to water	(Cracking plant)		..	2	..	16
Oil to water	(Crude stills)		*2	4	..	6
Oil to water	(Average condition in 46 installations)		..	..	16	22

*Galvanized steel containing 0.4 per cent copper and 0.08 per cent molydbenum.

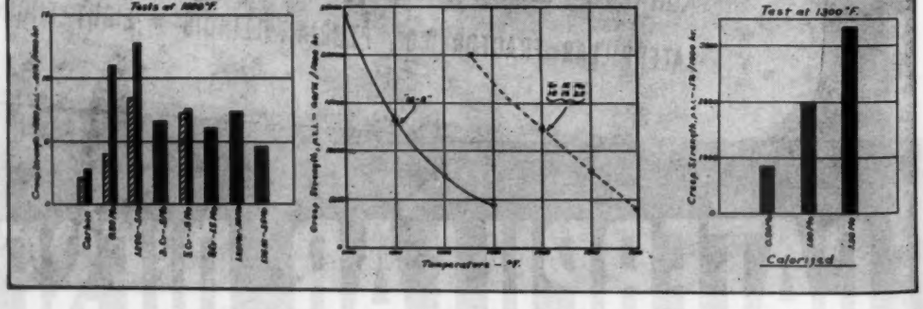

Fig. 1—Comparison of creep strengths of various steels

SQUEEZE CEMENTING

For Controlling Gas-Oil Ratios

By C. P. PARSONS
Vice President, Halliburton Oil Well Cementing Co.

Squeeze cementing means that cement slurry is forced, or "squeezed," by pressure into or against a permeable formation or through perforations in casing and liners for the purpose of shutting off water or for reducing gas-oil ratios.

Squeezing of cement is old, but there have been recent developments in method, technique and cement which are producing remarkable results. Cement slurry is being squeezed indiscriminately against both the oil-bearing and water-bearing portions of a producing formation without shutting off any of the oil but shutting off the water. Cement slurry is being squeezed indiscriminately against both the oil-bearing and gas-bearing portions of a producing formation without shutting off the oil but shutting off the gas. In certain areas where new wells produce with an excessive gas-oil ratio, cement slurry is being squeezed against the producing formation before the wells are completed for initial flow.

These uncanny results have not been flukes nor just a few jobs scattered here and there. There have been several thousand jobs during the past year with squeezing pressures up to 5,600 pounds per square inch, and averaging around 3,000 pounds, without shutting off the oil.

The earli[est] form of squeezing cement slurry in oil wells w[as] merely to place the slurry through tubing in the bot[tom] portion of a well, then raising the tubing to a sa[fe] distance above the slurry and imposing pump p[ressure] on the well. This required moving of [the] cement slurry after it had been placed and [when] a partial set. The squeezing was limited by [the] increased resistance of the slurry, due to its p[artial] set, and because the method did not provide for breaking down any film or other obstruction on the face of the formation before the slurry reached the formation. There were also early methods of squeezing through perforations and through leak-holes in casing.

Developments in Technique

Among the developments which lead up to the present form of squeezing are the following:

Better cementing technique, better cementing equipment to handle high pressures, special cements to set slowly under high temperatures, self-sealing fibred cements, packers and back-pressure valves, bridge plugs, electrical logging, wall scrapers, and gun perforators.

One of the essential elements in the success of present squeezing is that any obstruction at the face of a formation is first broken down by pumping water or acid into the formation at whatever pressure is necessary to overcome the obstructions.

In most saturated sand formations, or limes of similar permability, the pump pressure required to begin movement of water back into formation is usually higher than is required for continuing the movement. After water once begins moving into a relatively tight formation, the pump pressure usually starts dropping. When it reaches minimum, the necessary amount of cement slurry is mixed and pumped down through the tubing and squeezed against the formation, without stopping the flow. The cement slurry thereby follows the water into the formation and starts building up pump pressure. When this pump pressure reaches a desired maximum the squeeze is complete, but the mechanical equipment must be arranged so there will be no material loss of squeezing pressure while the tubing is being flushed or removed after the squeeze. If pump pressure does not build up during the squeeze, a desirable amount of cement slurry is pumped into the formation and allowed to set. The squeeze is then repeated until the desired maximum pump pressure is obtained.

A. P. I. — Presented at the Spring meeting, Mid-Continent District, Division of Production, Amarillo, Texas, Feb. 17, 1938

Squeezing Cement in Open Formation

In wells equipped with casing of suitable strength to handle high pump pressures, the tubing is run to bottom and raised a few inches. The top joint or joints of tubing are externally smooth and flush so that they can work under pressure through the stuffing box in a bradenhead. A valve is installed on top of the tubing to act as a choke. Water is pumped down through the tubing, with the bradenhead and choke open. When the water reaches the bottom of the tubing and some of it goes into the annular space behind the tubing, thereby flushing any loose solids from the face of the formation, the bradenhead is closed and pump pressure applied to the water so that it will enter the formation. When the pressure reaches a minimum the desired amount of cement slurry is mixed and forced down through the tubing and out against the formation, following the water.

In wells of low saturation and relatively high permeability the initial pressure may also be the minimum pressure. Some wells of that type may build up pressure rapidly when cement slurry reaches it and others of still higher permeability may even take the cement slurry without a material increase in pressure. Such cases require special handling and may require self-sealing fibred cement and more than one shot of cement. In the long list of new materials and methods it is possible to make many new combinations to get successful results in many stubborn types of formations.

In wells not equipped with casing sufficiently strong to handle the pump pressure, a drillable packing device containing a back-pressure valve is lowered into the well on the bottom of the tubing and set in the casing just above the casing shoe. Water is then pumped down through the tubing and into the open hole. The formation is broken down by the water under pump pressure and when the minimum pressure is reached the desired amount of cement slurry is mixed and forced against the formation, following the water. The tubing is then flushed, disconnected from the packer and then removed. The back-pressure valve in the packer holds the squeezing pressure.

In wells with limy formations some very successful results are being obtained by placing a shot of acid between the water and the cement slurry. The channels in the lime may be sufficient for free flow of water but the acid enlarges them for the cement slurry to follow more easily and farther into the formation. A special new packer is being used in acid-cement jobs in a highly permeable lime to separate the water-bearing portion of the lime from the oil-bearing portion. This procedure has produced successful results that were not obtained without the use of acid and packer.

Cementing Casing and Blank Liners

Squeezing of cement slurry is being done on casing jobs after the ordinary amount of cement slurry is placed behind the casing. This is done by closing the blowout-preventer rams around the casing at the surface and imposing pump pressure to force an additional amount of cement slurry behind the casing.

In squeezing behind blank liners which are run on tubing, a special shoe, equipped with back-pressure valves, is placed on the bottom of the tubing and the female portion of a male-and-female plug is installed at the upper end of the blank liner, just below the backing-off tool. This liner is run to the bottom of the well. The male portion of the male-and-female plug is placed in the top of the tubing ahead of the cement slurry. The slurry is pumped down through the tubing and when the male portion of the plug engages with the female portion the combined plug is forced downward through the liner and actuates the valves in the shoe. The cement slurry is forced out in four directions assuring complete filling of the annular space. When sufficient cement slurry is pumped out to fill the annular space, a bradenhead is closed at the surface and pump pressure applied to squeeze an additional amount of cement

Pumping plug to bottom after reconditioning a large water producer in the Talco Townsite field by plugging back with 50 sacks of cement

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Conclusive evidence of the conclusions of the Texas Co. metallurgical department regarding the value of various tube materials for the particular water conditions in this refinery, is evident in the following tabulation of the kinds of tubes in service since 1930.

	Percentage of various tubes in service 1930	1933	1936	Approx. cost, based on steel as unity
Steel	18 0	16 3	12 0	1 0
Stainless steel	60 3	14 9	5 6	4 8
Admiralty metal and other copper-base alloys	21 7	68 8	82 4	1 2

These figures are doubly notable because they are a record of data on more than 1,000 tube bundles containing over 500,000 tubes and for equipments used in all types of refinery service.

Scattered data on specific services are summarized in Table 1.

TABLE 1—LENGTH OF SERVICE OF VARIOUS STEELS

Service—	Material 1	Material 2	Months of service: Plain steel	4-6 chrome 0.5 moly steel	18-8 nickel steel	Admiralty metal
Oil to oil	Crude oil, 135° F.	Residue stock, 600° F.	72 or more	..	..	..
Oil to water	Water, 125° F.	Cycle oil, 300-550° F.	6	..	..	15
Oil to water	Water, 100° F.	Naphtha, 200-300° F.	3–8	..	..	12–24
Vapor to water	(Cracking plant)			2	..	16
Oil to water	(Crude stills)		*2	4	..	6
Oil to water	(Average condition in 46 installations)		..	..	16	22

*Galvanized steel containing 0.4 per cent copper and 0.08 per cent molybdenum.

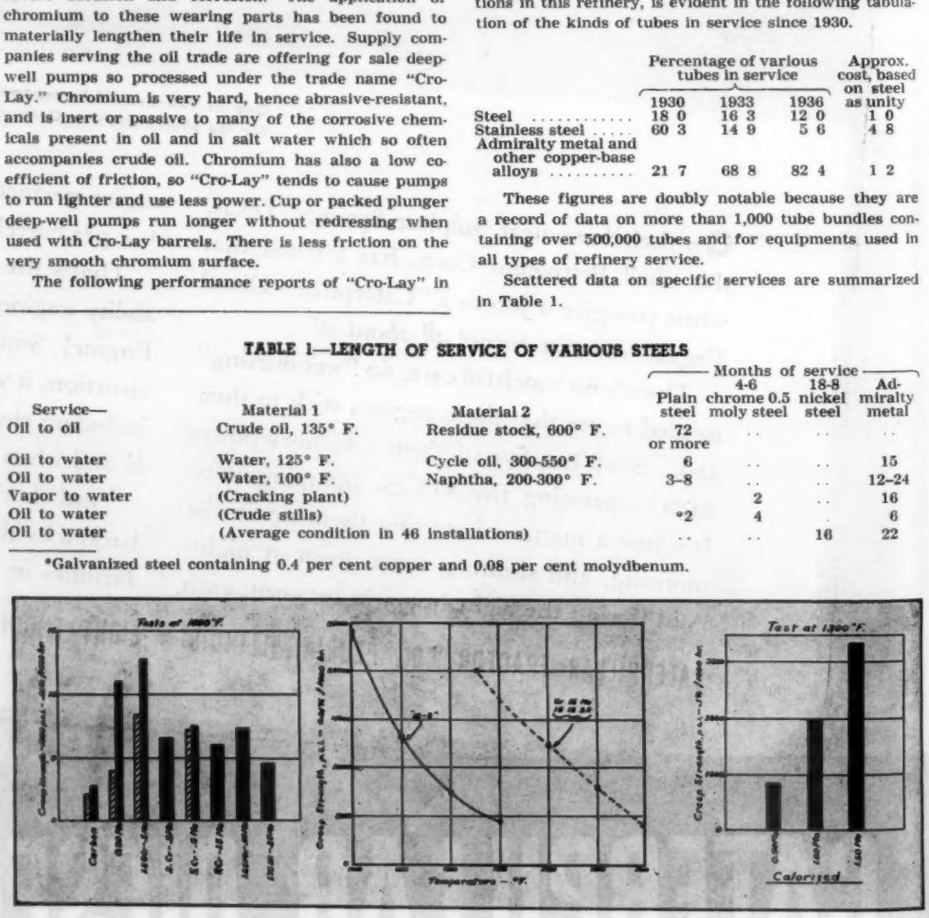

Fig. 1—Comparison of creep strengths of various steels

SQUEEZE CEMENTING

For Controlling Gas-Oil Ratios

By C. P. PARSONS
Vice President, Halliburton Oil Well Cementing Co.

Squeeze cementing means that cement slurry is forced, or "squeezed," by pressure into or against a permeable formation or through perforations in casing and liners for the purpose of shutting off water or for reducing gas-oil ratios.

Squeezing of cement is old, but there have been recent developments in method, technique and cement which are producing remarkable results. Cement slurry is being squeezed indiscriminately against both the oil-bearing and water-bearing portions of a producing formation without shutting off any of the oil but shutting off the water. Cement slurry is being squeezed indiscriminately against both the oil-bearing and gas-bearing portions of a producing formation without shutting off the oil but shutting off the gas. In certain areas where new wells produce with an excessive gas-oil ratio, cement slurry is being squeezed against the producing formation before the wells are completed for initial flow.

These uncanny results have not been flukes nor just a few jobs scattered here and there. There have been several thousand jobs during the past year with squeezing pressures up to 5,600 pounds per square inch, and averaging around 3,000 pounds, without shutting off the oil.

The earliest form of squeezing cement slurry in oil wells was merely to place the slurry through tubing in the bottom portion of a well, then raising the tubing to a safe distance above the slurry and imposing pump pressure on the well. This required moving of the cement slurry after it had been placed and taken a partial set. The squeezing was limited by the increased resistance of the slurry, due to its partial set, and because the method did not provide for breaking down any film or other obstruction on the face of the formation before the slurry reached the formation. There were also early methods of squeezing through perforations and through leak-holes in casing.

Developments in Technique

Among the developments which lead up to the present form of squeezing are the following:

Better cementing technique, better cementing equipment to handle high pressures, special cements to set slowly under high temperatures, self-sealing fibred cements, packers and back-pressure valves, bridge plugs, electrical logging, wall scrapers, and gun perforators.

One of the essential elements in the success of present squeezing is that any obstruction at the face of a formation is first broken down by pumping water or acid into the formation at whatever pressure is necessary to overcome the obstructions.

In most saturated sand formations, or limes of similar permability, the pump pressure required to begin movement of water back into formation is usually higher than is required for continuing the movement. After water once begins moving into a relatively tight formation, the pump pressure usually starts dropping. When it reaches minimum, the necessary amount of cement slurry is mixed and pumped down through the tubing and squeezed against the formation, without stopping the flow. The cement slurry thereby follows the water into the formation and starts building up pump pressure. When this pump pressure reaches a desired maximum the squeeze is complete, but the mechanical equipment must be arranged so there will be no material loss of squeezing pressure while the tubing is being flushed or removed after the squeeze. If pump pressure does not build up during the squeeze, a desirable amount of cement slurry is pumped into the formation and allowed to set. The squeeze is then repeated until the desired maximum pump pressure is obtained.

A. P. I. — **Presented at the Spring meeting, Mid-Continent District, Division of Production, Amarillo, Texas, Feb. 17, 1938**

Squeezing Cement in Open Formation

In wells equipped with casing of suitable strength to handle high pump pressures, the tubing is run to bottom and raised a few inches. The top joint or joints of tubing are externally smooth and flush so that they can work under pressure through the stuffing box in a bradenhead. A valve is installed on top of the tubing to act as a choke. Water is pumped down through the tubing, with the bradenhead and choke open. When the water reaches the bottom of the tubing and some of it goes into the annular space behind the tubing, thereby flushing any loose solids from the face of the formation, the bradenhead is closed and pump pressure applied to the water so that it will enter the formation. When the pressure reaches a minimum the desired amount of cement slurry is mixed and forced down through the tubing and out against the formation, following the water.

In wells of low saturation and relatively high permeability the initial pressure may also be the minimum pressure. Some wells of that type may build up pressure rapidly when cement slurry reaches it and others of still higher permeability may even take the cement slurry without a material increase in pressure. Such cases require special handling and may require self-sealing fibred cement and more than one shot of cement. In the long list of new materials and methods it is possible to make many new combinations to get successful results in many stubborn types of formations.

In wells not equipped with casing sufficiently strong to handle the pump pressure, a drillable packing device containing a back-pressure valve is lowered into the well on the bottom of the tubing and set in the casing just above the casing shoe. Water is then pumped down through the tubing and into the open hole. The formation is broken down by the water under pump pressure and when the minimum pressure is reached the desired amount of cement slurry is mixed and forced against the formation, following the water. The tubing is then flushed, disconnected from the packer and then removed. The back-pressure valve in the packer holds the squeezing pressure.

In wells with limy formations some very successful results are being obtained by placing a shot of acid between the water and the cement slurry. The channels in the lime may be sufficient for free flow of water but the acid enlarges them for the cement slurry to follow more easily and farther into the formation. A special new packer is being used in acid-cement jobs in a highly permeable lime to separate the water-bearing portion of the lime from the oil-bearing portion. This procedure has produced successful results that were not obtained without the use of acid and packer.

Cementing Casing and Blank Liners

Squeezing of cement slurry is being done on casing jobs after the ordinary amount of cement slurry is placed behind the casing. This is done by closing the blowout-preventer rams around the casing at the surface and imposing pump pressure to force an additional amount of cement slurry behind the casing.

In squeezing behind blank liners which are run on tubing, a special shoe, equipped with back-pressure valves, is placed on the bottom of the tubing and the female portion of a male-and-female plug is installed at the upper end of the blank liner, just below the backing-off tool. This liner is run to the bottom of the well. The male portion of the male-and-female plug is placed in the top of the tubing ahead of the cement slurry. The slurry is pumped down through the tubing and when the male portion of the plug engages with the female portion the combined plug is forced downward through the liner and actuates the valves in the shoe. The cement slurry is forced out in four directions assuring complete filling of the annular space. When sufficient cement slurry is pumped out to fill the annular space, a bradenhead is closed at the surface and pump pressure applied to squeeze an additional amount of cement

Pumping plug to bottom after reconditioning a large water producer in the Talco Townsite field by plugging back with 50 sacks of cement

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MARMON-HERRINGTON CO., Inc., *Factory and General Office,* **Indianapolis, Ind., U. S. A.**

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slurry against the formations behind the liner. Production is obtained by selective perforating and squeezing as explained later.

Squeezing Off Gas Before Running Casing

In one area, with a very permeable lime formation, a large amount of free gas is encountered in the upper portion of the formation, causing a very high gas-oil ratio. It is very desirable to case off this gas but in doing so in regular cementing procedure the cement slurry which is intended to go upward behind the casing goes out into the formation. In completing wells in this area under the new trend of squeezing, the gas-bearing portion is drilled into with a full gauge hole. The hole is reduced at the upper part of the oil-bearing portion of the formation. A tapered wooden plug is then driven into the tapered hole and a squeeze job applied in the gas portion of the formation. When this portion of the formation is cemented off so that it will not take any more cement slurry, the cement is allowed to set and casing is run to the top of the reduced hole and cemented. The squeeze job not only cuts down the gas-oil ratio but prevents a loss of cement slurry when the casing is cemented.

In several sand areas where wells have an excessive gas-oil ratio under regular completion practice, a squeeze job is being done against the open formation before each well is completed for its initial flow, thereby obtaining satisfactory ratios.

Selective Perforating and Squeezing

It has been the practice in some areas to cement casing or a blank liner through a producing formation and then obtain pipe line production with a nominal gas-oil ratio by selective perforating and squeezing.

The use of blank liners and selective squeezing is especially adaptable to wells which are making water from an unknown source, perhaps from an intermediate streak, in the open formations. One area has several streaks of sand in the open hole, one or more of which started making water after the wells had been producing for some time. The exact source of this water was not determined and many previous attempts to shut off the bottom of the hole by regular plug-back procedure failed to reduce the water. Under the new practice the blank liner is first cemented, as already described. After the cement has set, perforations are shot in the lower portion of the blank liner and tested. If they make water, cement slurry is squeezed through the perforations and allowed to set. Another set of perforations is made a little higher up and tested. This is repeated until the maximum amount of pipe line oil is obtained. Whenever any set of perforations produces pipe line oil they are allowed to remain open but if any produce water or excess gas they are squeezed off.

There are some areas where wells ordinarily completed have excessive gas-oil ratios and where heavy ratios of withdrawal cause a rapidly expanding free gas cap that shortens the effective life of a squeeze job in open formation, even though the job may be successful for a time. In such cases it has been found more effective to set a blank liner and selectively perforate and squeeze. Later, any time the rate increased a set of perforations could be squeezed.

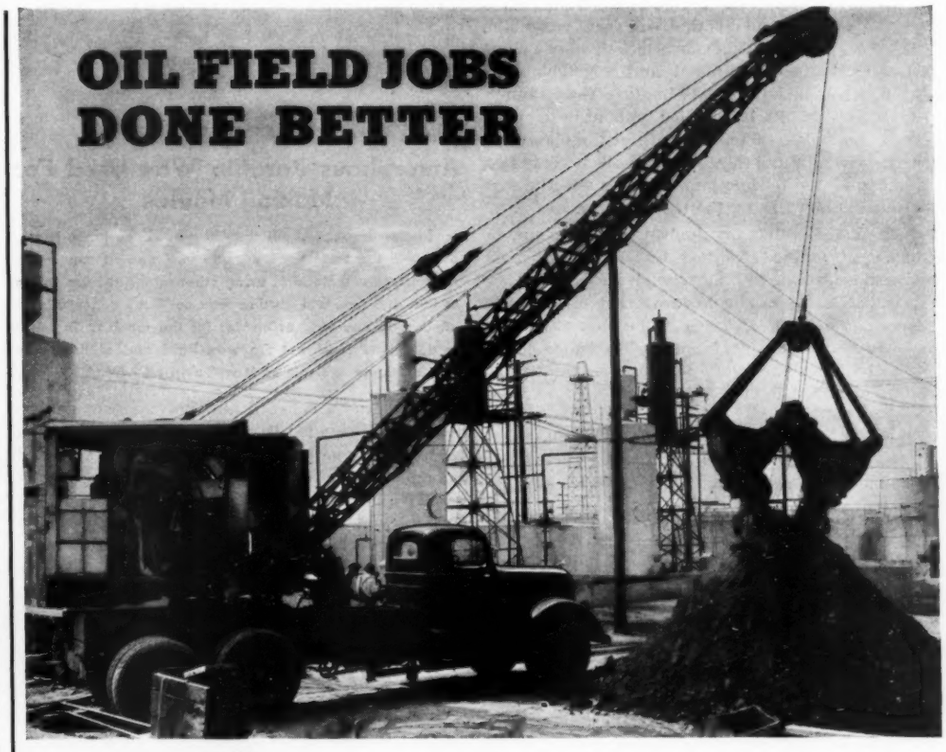
In another area wells are being completed by drilling a full-gauge hole through the producing formation and then cementing the casing with the shoe at the bottom of the producing formation instead of at the top. Pipe line production is then obtained by selective perforating and squeezing.

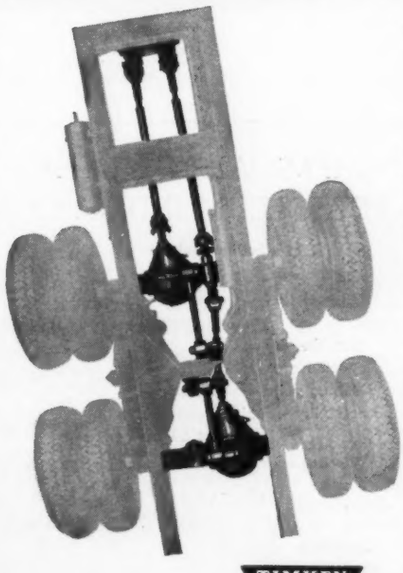
There has been a growing tendency in some areas to drill a well completely through all the known producing horizons in the area and then cementing casing through all the horizons with the cement slurry reaching above the most shallow producing horizon. This is done by either single-stage or multiple-stage cementing, depending upon the height of the upper formation and pressure required to place the cement slurry. When this is done the producing life of the well becomes a series of selective perforating and squeezing. When one producing horizon becomes depleted the perforations are squeezed off and another producing horizon is perforated. When water or excess gas occurs in any one producing horizon they are shut off by selective perforating and squeezing.

The modern form of squeezing has developed in a very short time from a few experimental jobs to approximately 200 jobs per month at the present time. Approximately one-third of these are in open hole and two-thirds are selective squeeze jobs through perforated casing. . . .

It must be said, however, that there is no general formula that can be applied discriminately in the handling of squeeze jobs. Some of the first jobs in an area have been headaches but were whipped without damage to a well and subsequent squeeze jobs made much easier. An adaptation of the squeeze in a new area with untried conditions should be approached with a background of all the headaches of the past. Adequate equipment should be used to handle high pressures. Special cements which will set slowly under high temperature should be used when high pressures are going to be used in deep wells.

Carefully handled, squeeze cementing has many useful applications. It already has a proven record of success in many hundreds of wells, thereby eliminating the expense and trouble of producing salt water. It also has a fine record of reducing gas-oil ratios in hundreds of other wells, thereby prolonging the natural flowing life of those wells and conserving the invaluable and irreplaceable natural energy.





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QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Iodine Test For Indicative Tendency of Oil to Oxidize

I wonder if you can direct me to any recent information regarding the iodine test, showing the affinity of oxygen for oil, and the relation of this test to oxidation?—I. B.

Iodine is absorbed by compounds containing unsaturated bonds, and oils that will readily combine with oxygen, which is a characteristic of the fixed oils. These include animal and vegetable oils, being designated fixed oils because they cannot, like petroleum oils, be distilled without decomposition. The matter of temperature distinguishes between fixed oils and fats. All fixed oils become fats when solidified by low temperatures and the fats become oils by raising the temperature.

The iodine value, or number, is the weight, in grams, of iodine absorbed by the unsaturated molecules present in 100 grams of the oil.

Since the fixed oils have a great affinity for oxygen, they will during continued use, oxidize as indicated by the sludge deposits formed. This is the basis for the iodine test, as the quantity of iodine absorbed is an indication of what may be expected in the form of sludge, because the iodine will quickly unite with those parts of the oil which have a tendency to oxidize.

Some iodine values are shown in the table:

TYPICAL IODINE VALUES OF OILS

Oils—	Iodine value
Linseed	Above 170
Cottonseed, fish, whale	100-170
Animal oils	50-100
Shale oil (sp. gr. 0.89)	23
White oil (Russian)	7
Paraffin base lube oil	10-16

The oxidation of the drying oils, linseed, is high, while the petroleum oils are low. The shale oil indicates a high percentage of unsaturated hydrocarbons.

The standard books on the analysis of fats and oils give the details of the method for determining iodine value.

Analysis of Maverick Springs Wyoming Crude Oil

Can you furnish an analysis of the oil produced in the Maverick Springs field, Wyoming. I am informed that this oil is not marketed. Can you tell me if this is due to some character of the oil?—S. E. R.

The Maverick Springs oil is of low gravity, containing but little gasoline, with a relatively high sulfur content, which may cause some difficulty when treating the light products. The U. S. Bureau of Mines has investigated this oil, stating that the wells are capable of producing 6,500 bbls. daily but no transportation facilities have been developed. These factors influence demand. The Bureau of Mines has analyzed samples of the oil, one had been in storage and the other was fresh oil obtained directly from a well. These analyses are shown in the table:

MAVERICK SPRINGS WYOMING OIL

	Stored	Fresh
Gravity, °A.P.I.	19.4	21.8
Sulfur, per cent	3.19	2.91
Viscosity S.U. at 100° F.	550.0	259.0
Pourpoint, °F.	5.0	Below 5
Color	Brownish black	Black

	Gravity	Per cent	Gravity	Per cent
Gasoline and naphtha	45.6	1.4	53.5	8.5
Kerosene	42.1	4.5	42.1	9.7
Gas oil	35.0	19.4	34.6	12.7
Lube distillate	....	31.1	....	28.6
Residue	8.3	43.4	8.4	40.3

The stored oil may have remained in the tanks for 10 or 12 years. The first well was drilled in 1918 but with no transportation facilities available little oil has been produced. The stored sample was collected in 1930 and had evidently lost by evaporation all of the light material.

Reference: Report U. S. Bureau of Mines, Dec. 31, 1937.

Amorphous Paraffin Wax Used For Making Moulds

I have a question which is of great importance to me, owing to the fact that I wish to use wax in connection with moulds. Instead of using other material I am trying to find one that will harden wax so that I can use it as an outside covering or carrier for the moulds. In order to do this, I must get the wax hard and at the same time not have it brittle so it will chip off.—W. L. C.

There is now being manufactured an amorphous paraffin wax which is remarkable in that it melts at much higher temperatures than the standard commercial paraffin waxes; it may be easily moulded and has no tendency to fracture. As an example, one refiner is now making a high grade product of this nature which has an A.S.T.M. melting point of approximately 165° F. It is not strictly amorphous but the crystals are so small that they may be classified as of micro size. It is the very small size of these crystals that cause the wax to behave as truly amorphous. This wax has no true melting point but softens and melts over relatively wide ranges, such as 10 or 15 degrees, before the specified melting point, where it begins to flow.

This wax is never hard and brittle but retains pliability and plasticity to a remarkable degree, even including very low temperatures.

Manufacturers of amorphous wax are now experimenting with material that may be finally processed so as to have a melting point of 185° F. and above. This wax will possess plasticity very much beyond that of any crystalline paraffin wax.

The high grade amorphous waxes may be coated with shellac or lacquer and in this way a hardened surface may be built on the outside of a mould made of this form of wax.

CHEMICALS FOR THE PETROLEUM INDUSTRY

Sodium Sulfide

Use—Special treating methods.

Form—Reddish brown crystals, flakes or solid.

Formula—Na_2S.

Specific gravity—1.856.

Melting point—Infusible.

Solubility—Cold water 15 per cent.
Hot water 59 per cent.

The properties are for the pure compound.

LIMITATIONS

Purity:	Per cent
Crystals	30-33
Flake	60-62
Solid	60-62

The percentages represent the anhydrous Na_2S. The crystals contain $9H_2O$ to the molecule.

Gasoline Yields Increased by Cracking Supplies Required Motol Fuel

Can you give me the figures showing the production of gasoline in the United States prior to the automobile and the date showing the increase in gasoline obtained by cracking?—E. S.

There was but little demand for gasoline until the automobile was made in large enough numbers to influence consumption. In the year 1909 the average yield of gasoline and naphtha from all the crude oil in the United States was 10.7 per cent, but in 1914 the refiners obtained 18.2 per cent. During these five years the annual registration for passenger automobiles was: 1909—305,950; 1910—458,500; 1911—619,500; 1912—902,000; 1913—1,194,262; 1914—1,625,739.

The production of crude oil could not be increased to meet the motor fuel requirements of the public, which had absorbed in 1914 five times the number of automobiles over 1909. The first cracking stills to be put into operation began to yield gasoline on a commercial scale in 1912. The percentage yields for each year, together with gallons per barrel of crude oil, are shown in the table:

AVERAGE YIELD OF GASOLINE AND NAPHTHA IN THE UNITED STATES

Year—	Per cent	Gallons per barrel
1936	44.1	18.5
1935	44.2	18.6
1934	43.4	18.2
1933	43.7	18.3
1932	44.7	18.8
1931	44.3	18.6
1930	42.0	17.6
1929	39.3	16.5
1928	37.4	15.7
1927	36.0	15.1
1926	34.9	14.7
1925	32.4	13.6
1924	31.2	13.1
1923	30.0	12.6
1922	28.8	12.1
1921	27.1	11.4
1920	26.1	11.0
1919	25.2	10.8
1918	25.3	10.6
1917	21.5	9.0

The yield does not include natural gasoline added. These figures, indicating an increase in the yield of gasoline from 18.2 to 44.1 per cent show what the cracking process has meant to the industry. The quantity has been more than doubled; without cracking the public could not have been supplied with enough motor fuel and consequently the selling price of gasoline would have been many times what it is today. It is true that the refiner has made improvements in the method for separating the gasoline directly from the crude oil, but the resulting increased yields have been but slight as compared with the volumes produced through cracking processes.

Reference: A.P.I. Petroleum Facts and Figures, 5th Edition, 1937.

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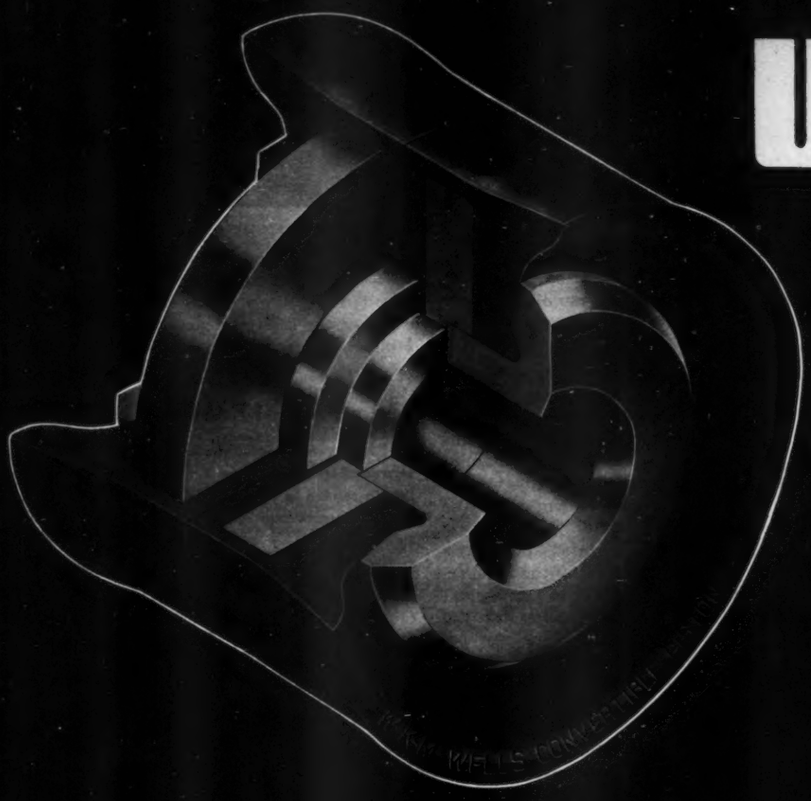

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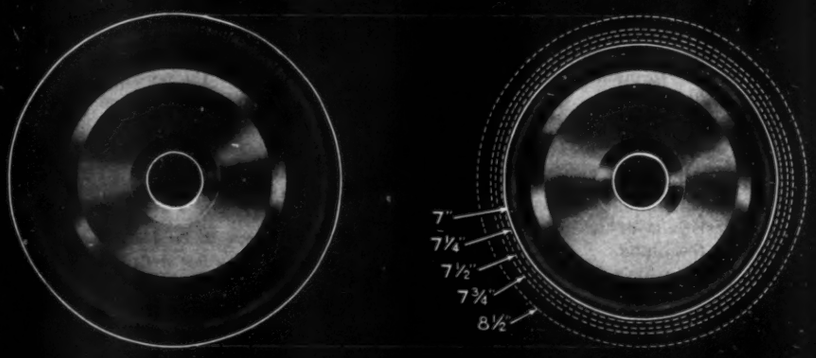
This piston has proven thoroughly successful in over 12 months service under all adverse conditions, and is rapidly being adopted as standard by both major operators and contractors.



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PROBLEMS FROM READERS

Edited by L. G. E. Bignell

Determining Porosity and Permeability by Electric Methods

Can you furnish information as to the principle on which the Schlumberger oil well exploration system works? I am especially interested in the principle by which the resistance and porosity of the various strata are determined by electrical means.—D. H. B.

The answer to your question will be found in an article by C. and M. Schlumberger and E. G. Leonardon entitled "Electrical Coring; a Method of Determining Bottom-Hole Data by Electrical Measurements" published on page 237 of "Geophysical Prospecting—1934," one of the Transactions of the American Institute of Mining and Metallurgical Engineers, Vol. 110.

In that paper the complete theory of the Schlumberger electrical coring method is explained and it should be read in its entirety if a complete understanding of this method is to be had. However, as you ask for explanation of only a part of this method the following is quoted from the article and it is hoped it will suffice.

Porosity of rocks is ascertained by the Schlumberger method as follows:

"When an electrolyte is caused to flow through a sheet made of a pervious, solid dielectric, an electromotive force occurs between the two sides of the sheet. This electromotive force is proportional to the pressure, to the electrical resistivity of the liquid, and inversely proportional to its viscosity. It is independent of the thickness of the filtering sheet, and of the radii and number of pores of the pervious medium. It may be expressed by the following formula:

$$E = m \times \frac{R}{V} P \qquad (1)$$

in which

E is the electromotive force of filtration,

P is the pressure of the liquid,

R the electrical resistivity of the liquid,

V the viscosity of the liquid,

m a constant factor which depends on the porous medium.

"It is interesting to compare this law with those discovered by Poiseuille for gases and by Slichter for liquids, which provide that the quantity of fluid flowing through a capillary tube is proportional to the difference of pressure and inversely proportional to the viscosity. With the notations employed above, we have

$$Q = m' \frac{P}{V} \qquad (2)$$

Q being the quantity of liquid which flows through the capillary tube and m' a constant factor.

"Through the combination of formulas 1 and 2, we obtain the expression

$$\frac{E}{Q} = \frac{m}{m'} R$$

which shows that the electromotive force of filtration is, for a given electrolyte, proportional to the amount of liquid that filters through, and to its electrical resistivity. This force, as can be seen, is thus in close connection with the porosity of the filtering medium.

"In most cases, the sign of this electromotive force is such that the electric current which it causes to flow possesses the same direction as the liquid in movement. In the case of a pervious sheet, then, it is the wall of ingress of the liquid which is negative with respect to the wall of egress.

"In most drill holes, the well is filled with water in sufficient quantities to exert a pressure on the walls distinctly superior to the hydrostatic head which exists in the rocks. This is particularly true in the numerous cases where the muds filling the holes are purposely made heavier to avoid as much as possible the caving in of the hole and blowouts of gas or oil. Under these circumstances, the water of the muds penetrates into the pervious layers traversed by the hole, repelling the liquid which they contain (water and oil). It is this filtration which generates the phenomenon of electrofiltration. Since the potential is increasing in the direction of flow of the liquid, a minimum of the potential must be observed in practice at the face of any pervious layer encountered. It is not a question of minor electric phenomenon, and potential differences of 100 or 200 mv. usually are observed over a length of a few meters."

In the article there follows a detailed explanation of the measuring apparatus used and a diagram is included.

"The porosity diagram also permits the study of the permeability of the rocks in the drill hole itself, and the direction of flow of the fluids between the rocks and the bore-hole. It is easy to understand the great importance of this information, which leads to the diagnosis of the petroliferous zones and water-bearing levels. It will be possible with the use of the porosity graph to detect the water-bearing diaclases and faults."

Possibilities of Oil in Presidio County, Texas

Having some interests in Presidio County, Texas, I am anxious to learn if any test wells have been drilled there for gas or oil and if any of them have been producers.—S. K. J.

There is record of less than a dozen wildcats having been drilled in Presidio County, all nonproductive. A large part of this county is mountainous and therefore not considered very favorable for gas and oil accumulation. It is a rather inaccessible region and even if gas and oil were found there it would be slow in developing because of the high cost necessary to transport the product to market.

Accuracy of Reserve Oil Estimates

For several years engineers have been estimating recoverable oil reserves. Can you furnish any information in regard to the correctness of estimates made from 10 to 15 years ago as proven by actual production results?—B. F.

In reply to your letter asking about the accuracy of former reserve estimates we enclose a tabulation showing various reserve estimates since July 18, 1925, together with yearly production during the years 1926-1937, inclusive, and total production up to January 1, 1938. In addition the table includes number of new oil wells completed each year for the same period, total producing oil wells reported each year and wells abandoned. These figures are included to indicate how the industry has kept abreast of the crude oil demand by drilling new wells each year. From the drilling well statistics it is interesting to note that an average of 13,920 new wells were completed each year, and 10,163 abandoned and the average number of producing wells was 327,742 for the 12-year period.

Further study of the tabulation indicates that during the 12-year period the oil wells completed in 1937 exceeded the average for the period by 69.4 per cent and the total wells producing were 71.75 per cent above average. During 1931 the low activity in well completion and total wells producing was reached with 51 per cent below average for completions and 31.8 per cent below average for producing wells.

From this type analysis it is to be deduced that the industry adjusts itself to supply and demand by varying the rate of drilling and production and this is a more vital factor to the economic life of the industry than "estimated reserves." "Critical rate of production" will determine the ability of the production branch of the industry to supply the refining end with the crude it needs to manufacture the products the public uses and as long as the industry is in a position to increase or decrease oil brought to the surface to meet current still run demands things will be satisfactory.

ESTIMATED RESERVES, YEARLY AND TOTAL PRODUCTION AND WELL STATISTICS, 1926-1937, INCLUSIVE

Year	Estimated reserves	Production by years	Total oil produced	New oil wells	Total oil wells	Abandoned
1926	5,321,427,000[1]	775,561,175	9,453,339,275	18,976	318,615	6,477
1927	4,500,000,000[2]	903,850,687	10,357,189,962	14,451	323,312	9,754
1928	[3]	897,995,265	11,255,185,227	12,532	327,800	8,044
1929	[3]	1,004,268,723	12,259,451,950	15,572	328,200	15,172
1930	[3]	901,740,870	13,161,192,820	11,640	327,268	12,572
1931	[3]	845,803,454	14,006,996,274	6,788	317,305	16,751
1932	10,000,000,000[4]	785,304,403	14,792,300,677	10,444	317,684	10,065
1933	12,000,000,000[5]	901,273,323	15,693,574,000	8,068	319,419	6,333
1934	13,360,000,000[6]	903,104,233	16,596,678,233	12,512	327,650	4,281
1935	12,177,000,000[7]	990,620,755	17,587,378,988	14,663	332,806	9,507
	13,632,000,000[8]					
1936	[3]	1,089,113,699	18,676,492,687	17,802	343,477	7,131
1937	12,501,839,546[9]	1,264,117,102	19,940,619,789	23,690	351,206	15,871
Total		11,262,751,689	19,940,619,789	167,049		121,958
Average				13,920	327,742	10,163
1937	12,904,946,546[10]					
1938	13,489,457,944[11]					
1938	12,909,000,000[12]					
1938	15,507,268,000[13]					

[1]Estimate by Committee of Eleven for A.P.I., July 18, 1925. [2]Federal Oil Conservation Board, September 1, 1926. [3]No estimates available. [4]Federal Oil Conservation Board's revised figures, 1932. [5]By V. P. Garfias, January 1, 1933. [6]U. S. Bureau of Mines, January 1, 1934. [7]A.P.I. Committee original estimate, January 1, 1935. [8]A.P.I. Committee revised estimate, April, 1937. [9]The Oil and Gas Journal estimate, January 1, 1937. [10]The Oil and Gas Journal 1937 revised estimate, January 1, 1938. [11]The Oil and Gas Journal reserves as of January 1, 1938. [12]Alex McCoy estimate for Governor Marland. [13]A.P.I. Committee, January 1, 1938.

FIELD OPERATIONS

Summarizing the Week's Developments

TEX-LA-ARK—The old shallow Blue Lake pool in Sabine Parish, Louisiana, seems destined to join the important deep sand pools of the Tex-La-Ark division. The deep-discovery well created a sensation on Sunday by staging a flow for 15 minutes causing observers to estimate it all the way up to 10,000 bbls. a day potentially. It was shut in for tankage. A test of the wildcat east of Magnolia, Columbia County, Arkansas, on Sunday and Monday assured the owners they had opened a pool.

TEXAS—A new field is in the making in Andrews County, West Texas. The discovery well in southwestern Callahan County produced 896 bbls. in nine hours from Ordovician lime. In Limestone County, eastern Texas, Stanolind Oil & Gas Co.'s deep test was dry at 9,951 feet, deepest hole in eastern Texas, but it will be tested in upper levels. The second well in the Flag Lake pool in Henderson County tested 2,500 bbls. in 24 hours. A 115,000,000-foot gas well was completed in the Long Lake field in Anderson County.

GULF COAST—The first oil well in the Gulf of Mexico off the Louisiana Coast came in Monday and was good for 250 bbls. initially. Two outposts to the Fairbanks pool in Harris County, Texas, are showing for extension wells. A test 800 feet north of the Bay City discovery well in Matagorda County is dry, likewise a northern outpost to the Hardin field in Liberty County.

CALIFORNIA—The deepest well in the world, being drilled by Continental Oil Co. in Kern County, was actively rotating below 14,112 feet.

OKLAHOMA—A wildcat in section 8-13-3e, Lincoln County, was being watched closely as it ran high structurally and was given a good chance to open a pool. The Hunton lime area in the Fitts field, Pontotoc County, was extended one-fourth mile southeast when a test started as a water disposal well found production. A 141,000,000-foot gas well was completed on the east side of the Cement field, Pontotoc County. Location was announced for a wildcat in section 1-20-23w, Ellis County. The state's deepest test in section 14-4n-5w, Grady County, was drilling below 11,125 feet.

KANSAS—The Cunningham pool was extended one-fourth mile northeast in Kingman County with a 68,688,000-foot gas well in section 20-27-10w. The largest Cowley County oil well in recent years was completed in the Weathered pool, for flowing potential of 3,642 bbls. of oil naturally. A pool was opened in section 14-22-13w, Stafford County. A wildcat south of Yates Center in Woodson County was showing as a Mississippi lime producer.

NEW MEXICO—Activity was expected to increase materially in the Vacuum area, Lea County, with completion of pipe line outlet, contract for which was awarded the past week. A 750-bbl. well was completed the past week in the Vacuum pool, where 14 wells are drilling in addition to several nearby wildcats.

PENNSYLVANIA—The fifth big initial producer in the Stray sand in the ancient Bradford field, in McKean County, started between 40 and 50 bbls. per hour and a sixth well is in the pay. The sand lies above the regular field pay.

Completions in All Fields

(Week Ending March 12, 1938)

	Oil	Gas	Dry	Total	1938 total comp. to date	1937 total comp. to date
N. Y., Pa. and W. Va.	42	18	5	65	1,027	870
Ohio	2	5	5	12	197	186
Indiana	0	2	4	6	22	27
Kentucky	6	2	5	13	146	25
Illinois	8	0	5	13	115	4
Michigan	8	1	6	15	150	155
Kansas	22	3	9	34	386	393
Oklahoma	9	2	11	22	340	507
Texas:						
North Central Texas	36	0	14	50	493	512
West Texas	39	0	4	43	470	474
Texas Panhandle	11	1	1	13	154	123
East Texas	34	0	0	34	508	406
East Central Texas	2	1	4	7	82	130
East Texas Border	1	0	1	2	27	85
Gulf Coast Texas	16	1	5	22	242	242
Southwest Texas	36	0	10	46	403	636
Total Texas	175	3	39	217	2,379	2,608
North Louisiana	9	0	1	10	117	74
Gulf Coast Louisiana	7	0	3	10	104	90
Total Louisiana	16	0	4	20	221	164
Arkansas	2	0	1	3	41	18
Montana	0	0	0	0	8	15
Wyoming	1	1	5	7	36	17
Colorado	0	0	0	0	1	5
New Mexico	6	0	2	8	113	143
Utah	0	0	0	0	0	0
California	16	0	2	18	272	255
Total United States	313	37	103	453	5,454	5,392
Total previous week	376	26	101	503		
Difference	63	11	2	50		

Outstanding Fields--Highlights

(Week Ending March 12, 1938)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
Hastings	6	11	8	4,437	490	18,910
McCampbell	2	5	0	0	108	4,527
Saxet	3	6	2	211	588	37,125
Benavides	3	10	4	615	158	9,316
East Texas	42	81	34	1,763	24,730	427,750
Talco	0	6	1	170	619	26,500
K.M.A.	44	127	15	12,224	173	8,000
Ector County	13	83	15	12,675	910	27,225
Winkler County	5	24	6	4,918	1,593	28,200
OKLAHOMA						
Fitts-Jesse	2	10	0	0	963	68,675
Oklahoma City	1	19	1	360	1,057	124,075
KANSAS						
Barton County	3	20	3	2,388	296	9,205
Ellis County	4	23	4	7,929	290	10,300
Rice County	6	27	2	523	1,121	33,175
Russell County	8	49	3	1,683	1,024	28,130
NEW MEXICO						
Lea County	17	105	2	2,070	1,643	96,700
LA-ARK-TEX						
Rodessa, Ark.	1	7	1	525	68	7,790
Rodessa, La.	0	5	2	665	448	42,345
Rodessa, Tex.	1	25	1	115	399	35,510
Lisbon, La.	1	10	2	950	185	9,890
Shuler, Ark.	1	17	1	900	36	15,525
Jennings	3	8	3	461	100	15,936
MICHIGAN						
Buckeye	3	18	3	1,036	374	26,694
ILLINOIS						
Central Illinois	27	106	8	3,143	308	26,400
CALIFORNIA						
Wilmington	14	36	6	11,979	370	102,750

Southwest Texas District

By
F. L. SINGLETON

Deep Sand in Oilton Field; Revival in Mirando Valley

CORPUS CHRISTI, Tex., Mar. 14—The opening of a new sand has revived interest in the Mirando Valley field, Zapata County, Laredo district's oldest producing field, and an extensive drilling program is anticipated. Other news of importance was the opening of new sands in the Plymouth field, San Patricio County, and in the Luby field, Nueces County.

Much drilling activity was expected to result from the completion of Burt Calvin No. 1 Lopez, east of production in the old Mirando Valley field, Zapata County. Sand showing oil was topped at 1,873 feet and cored to a total depth of 1,881 feet, where it was completed for an initial production of 150 bbls. of 21.8-gravity oil per day, through a three-eighths inch choke, with 320 pounds of shut-in casing pressure. The well is in section 253, due east of the main production which is developed slightly below 1,400 feet.

The Mirando Valley field dates back to 1921, and although the production was confined to a small area, it set off an extensive development which led to the discovery of numerous fields along this trend. The opening of this sand will no doubt affect drilling in other such types of field.

A deeper sand for the Oilton field, Webb County, was indicated with the showing of Campbell & Killam No. 5 Thompson, Block 11, Survey No. 1105. Casing was cemented for a production test after a drill stem test at 2,473-82 feet showed 40 feet of oil and some mud. The sand is believed to be the Rosenberg horizon in the Cockfield formation. The main production is developed at 1,900-2,000 feet. Oilton, and the Killam field, north of Oilton, are practically joined and are considered one of the most important shallow producing areas in Southwest Texas.

In the northeastern part of the county, W. S. Hill No. 1 Adami is being watched after logging a show in the Mirando sand at 1,012-17 feet. It is being cored deeper, however, after a drill stem test at 1,012-20 feet showed 150 feet of drilling mud with an oil taste and a slight blow of gas. Location is in the A.B.&M. Survey No. 345.

Wildcats Increasing

The increasing number of wildcat operations located along the Benavides trend in Duval County, has attracted wide attention and some interesting developments are expected in the near future. The most promising test now drilling is Atlantic Refining Co. No. 1 Frank J. Gravis, which is coring in sand below 5,008 feet. Sand with a slight odor was logged at 4,980 feet. To the northeast a location for a 6,500-foot test was staked by Rowan & Hope on the C. K. Gravis lease in the northeast corner of section 90. Southwest of the Atlantic well in section 245, Frank J. Gravis No. 1 Mergerle, a projected 6,000-foot test has resumed drilling operations.

In the Corpus Christi district, a revival of drilling was forecast for the Plymouth field, San Patricio County, following the opening of a deep sand by Plymouth Oil Co. No. 95-C Welder, section 49, Welder Ranch Subdivision. On a 12-minute drill stem test at 6,150-59 feet, total depth, it tested 1,050 feet of 40-gravity oil and 135 pounds of working pressure. Seven and five-eighths inch casing has been cemented on bottom. This is the fourth producing sand for the field. Other sands are found at 5,500, 5,600 and 5,900 feet.

In the same county and located in the newly opened East White Point field, Plymouth Oil Co. announced location for three wells. Material is being moved in for No. 1 L. Kellog, a south offset in section 62, while No. 1 W. H. Nelson and No. 1 J. H. Owens are located in the same section. Approximately 3,000 feet southeast of the discovery well, Smith Drilling Co. No. 1 French is drilling in shale below 4,687 feet.

West Saxet Field

The West Saxet field, Nueces County, was extended 2,600 feet to the east with the completion of C. Andrade No. 1 John Dunn, which is flowing 5 bbls. per hour through a 9/64-inch choke, with tubing pressure 850 pounds and casing pressure 1,000 pounds. The hole is bottomed in 5,832 feet and production was obtained by perforating the casing at 5,814-22 feet. West of the discovery well, Phillips Petroleum Co. No. 1 Clark topped oil sand at 5,822 feet and the well is being completed at a total depth of 5,831 feet. This field, opened in January is becoming the most active area in the district. At the present time there are nine rigs running and additional locations are being announced each week.

The Luby field, Nueces County, was given added importance with the opening of a deeper sand by Seaboard Oil Co. No. 13 Luby in the northwest side of the field. The hole is bottomed at 5,721 feet and casing was cemented for a production test after a drill stem test at 5,692 feet showed several hundred feet of 42-gravity oil. Although the majority of the wells are producing from the 5,000-foot zone, sands are found at 4,000 and 4,300 feet.

In the western part of the county, in the Agua Dulce field, Union Producing Co. marked up a record when it cemented 4,225 feet of 16-inch, 84-pound pipe in No. 1 Minnie Brown, a projected 12,000-foot hole. The casing was run in and cemented in 25 hours. It weighs 354,900 pounds.

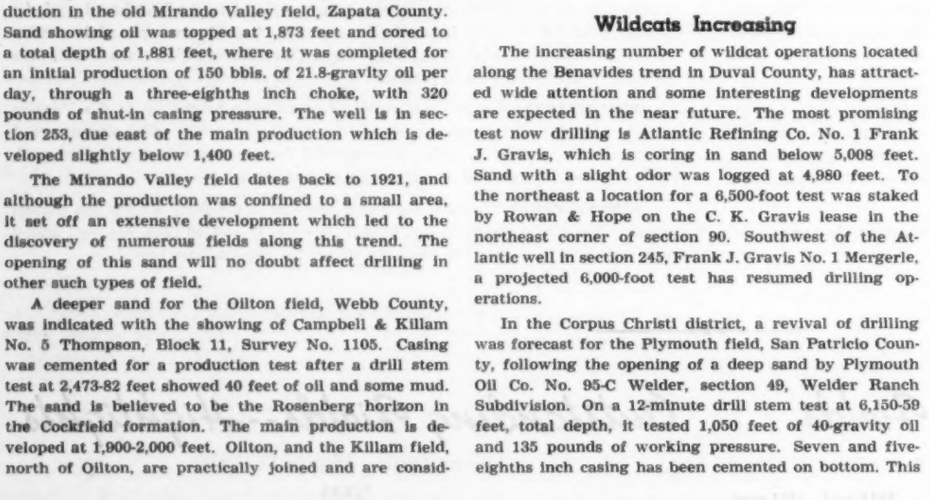
Along the Jackson trend, in the recently opened Alfred field, Jim Wells County, Rowan & Hope No. 2 Adams cored sand showing oil at 3,214-22 feet, and shale was cored at 3,222-32 feet, total depth. Five and one-half inch casing was cemented on bottom and a production test through perforated casing at 3,219-20 feet showed salt water. The perforations have been squeezed off and another test will be made higher in the zone. Location is in Block 28, southwest of the discovery well. Locations for two more wildcats were announced. E. Calloway has derrick up for No. 1 Garcia in section 54, R. E. L. King Survey, while H. H. Howell and others are preparing No. 1 Lindsey in the La Vaca Grant Survey.

Blow-Out in Goliad

In the Maetze area, Goliad County, Windward Oil Co. and others No. 1 Drier, 2,000 feet northeast of the discovery well, blew out while drilling at 5,530 feet, and is now running wild. This is no doubt a new sand for the structure as the discovery well was a dry gas well producing through perforated casing at 3,880-88 feet. No. 1 Drier logged the discovery pay last week at 3,806-15 feet where it showed 400 pounds of pressure and a slight amount of oil-cut mud.

In Victoria County, northwest of the town of Inez. Superior Oil Co. and L. A. Gillespie started drilling operations on No. 1 J. Carroll in the J. F. Johnson Survey. Midway between the Placedo and Keeran fields, Stanolind Oil & Gas Co. is preparing for a production test in No. 1 Vandenberg, salt water sand was cored at 6,510 feet, total depth, and 7-inch casing was cemented at 6,400 feet. It is about a half mile southeast of the

(Continued on Page 133)



Porter Regenold Maps, Corpus Christi

Luby field, Nueces County, showing location of Seaboard Oil Corp. No. 13 Luby which is opening production from a deep sand

Rocky Mountain Area

By
T. R. INGRAM

Prospect in Eastern Colorado to Be Continued Downward

DENVER, Colo., Mar. 14.—The Gulf Oil Corp. wildcat in eastern Colorado is preparing to drill deeper to original objective after test at 4,813 feet failed to show commercial production.

G. R. McConnell No. 1 Government, in Albany County, Wyoming, was completed as a small discovery at 920 feet. The Ohio Oil Co.-California Co. No. 6 Union Pacific-Johnson, west side of Big Medicine Bow, was a small gas well in the Upper Sundance. Their No. 4-A Kyle is showing for a good producer. Four shallow wells were abandoned in the Shawnee district, Converse County. The General Petroleum Corp. wildcat at Cole Creek recovered saturated cores in the First Wall Creek and is preparing to test. Three wells in the deeper pay at Lance Creek are showing saturation as they near completion. One is an extension on the west. Drilling is resuming in the Osage field.

R. C. Tarrant will test the Roscoe structure in Carbon County, Montana. Drilling operations are resuming slowly in Cut Bank and Kevin-Sunburst.

NEW MEXICO

Activity in the Vacuum area in Lea County is expected to increase considerably with completion of a pipe line outlet, contract for which was let the past week. The contract was awarded by Texas-New Mexico Pipe Line Co. to Oklahoma Construction Co. for 14 miles of 8-inch line from the Vacuum pool to Lynch station, where it will tie in with 4 miles of 4-inch line already in operation. Equipment for the line was being moved in.

An interesting wildcat 4 miles northwest of nearest Vacuum production was being started at Repollo Oil Co. No. 1 State, SE cor. section 6-17-34. Some 14 wells are being drilled in the Vacuum pool, in addition to several outlying wildcats in that general area.

Comparatively few completions in southeast New Mexico were recorded, although drilling activity continued unabated. Recent completions were:

George F. Getty No. 1 State, NE NE section 36-17-34, Vacuum area, Lea County, flowed 750 bbls. of oil daily through choke at 4,550 feet, total depth, in lime. Gas gauged 750,000 feet.

Continental Oil Co. No. 2-B-23 Reed, SE NE section 23-20-36, Monument district, Lea County, was completed at 3,871 feet in lime. It was acidized and made potential of 1,320 bbls. of oil, flowing through choke, with 1,350,000 feet of gas.

Continental Oil Co. No. 3-B-31 Lockhart, Eunice field, Lea County, was completed as a 25,000,000-foot gas well at 3,924 feet, total depth.

In Eddy County, Nash & Windfohr No. 2-B Stevens, NW section 13-17-30, was bottomed at 3,515 feet and had initial production of 231 bbls. of oil daily.

Neil Wills and others No. 1-A State, C S half SW SE section 17-20-30, produced at the rate of 5 bbls. of oil an hour at 1,476 feet, total depth.

Woodworth Hawkins No. 1 Mack, C SW SW section 20-24-27, had a hole full of sulfur water and was abandoned at 3,241 feet, total depth.

M. A. Grisham No. 1 Claytor, NE section 10-24-26, was a 10-bbl. oil well at 1,967 feet, total depth.

Lea County

Amerada Pet. Corp. No. 6 Byrd, SE sec. 12-20-36. Loc.
Amerada Pet. Corp. No. 3 Laughlin, C NW NE sec. 9-20-37. T.D. 2,855 ft.; set 8-in. 2,573 ft.
Amerada Pet. Corp. No. 1 State VA, C SE SW sec. 23-17-34. Drlg. 1,540 ft.
Amerada Pet. Corp. No. 1 State VB, C NE SW sec. 36-17-34. T.D. 811 ft.; set 7⅝-in. 798 ft.
Anderson-Prichard Oil Corp. No. 1 Carlson, C SW NW sec. 21-25-37. O.W.D.D.; T.D. 3,020 ft.; C.O.&F. 20 B.O.P.D.
Anderson-Prichard Oil Corp. No. 1 Harrison, SW cor. sec. 23-25-37. T.D. 3,347 ft.; running tubing.
Anderson-Prichard Oil Corp. No. 2 Jal, C NW NE sec. 8-25-37. T.D. 2,540 ft.; straightening hole.
Anderson-Prichard Oil Corp. No. 1 Wells, C SE SE sec. 5-27-37. Drlg. 3,610 ft.
Anderson-Prichard Oil Corp. No. 2 Langlie, SE sec. 8-25-37. Drlg. 3,420 ft.
Bradley Oil Co. No. 1 Downes, SE NE SE sec. 5-22-37. T.D. 620 ft.; W.O.C.
Cities Service Oil Co. No. 1-H State, C NE NE sec. 17-22-36. T.D. 3,884 ft.; prep. to deepen.
Continental Oil Co. No. 1-A-22 Elliott, C SW SW sec. 22-22-37. O.W.D.D.; T.D. 3,592 ft.; shot; F. 69 B.O.P.D.
Continental Oil Co. No. 3-B-6 Elliott, C SE SE sec. 6-22-37. T.D. 3,778 ft.; flows 25 B.O.P.D.; C.O.
Continental Oil Co. No. 1-B-9 Elliott, NW sec. 9-22-37. T.D. 3,725 ft.; F. 45 B.O.P.D.; S.I.
Continental Oil Co. No. 1-A-20 Jack, C NE SE sec. 20-24-37. T.D. 3,585 ft.; F. 106 B.O.P.D.
Continental Oil Co. No. 1-A-31 Marsh, SE sec. 31-20-39. Wildcat; T.D. 4,346 ft.; swedging.
Continental Oil Co. No. 3-B-23 Reed, C E½ SE SE sec. 23-20-36. Derrick.
Continental Oil Co. No. 4-B-24 Reed, CEL NW SW sec. 24-20-36. R.U.R.
Continental Oil Co. No. 8-A-14 Sanderson, NE NW SE sec. 14-20-36. T.D. 1,170 ft.; W.O.C.
Continental Oil Co. No. 1-B-14 Sanderson, NE SW SE sec. 14-20-36. Drlg. 3,710 ft.
Continental Oil Co. No. 3-E-17 State, C NW NW sec 17-22-36. T.D. 3,877 ft.; running tubing.
Continental Oil Co. No. 1-F-1 State, C SW SW sec. 1-21-36. T.D. 3,847 ft.; testing.
Continental Oil Co. No. 1-B-12 State, C SE SW sec. 12-18-35. T.D. 293 ft.; running casing.
Continental Oil Co. No. 1-H-35 State, C SE NE sec. 35-17-34. Cellar, pits.
Cranfill & Germany No. 1 Weir, C NE NE sec. 15-20-37. T.D. 4,210 ft.; S.D.O.
Culbertson & Irwin No. 2 Alston, NE SW NW sec. 26-25-37. T.D. 3,195 ft.; set 7-in. csg.; W.O.C.
Culbertson & Irwin No. 7-A Humphrey, NE SW SE sec. 3-25-37. Loc.
Culbertson & Irwin No. 1 Liberty Royalty, NW sec. 3-25-37. T.D. 3,090 ft.; standardizing.
J. P. Cusack, Inc., No. 1 Turner, SW NE SE sec. 34-18-38. Drlg. 3,065 ft.
Danglade & Clower No. 1 Currie, NE NE SW sec. 6-21-37. Drlg. 800 ft.
Danglade & Clower No. 1 Glier, C SW NE sec. 32-22-37. Drlg. 3,670 ft.
L. E. Elliott No. 2 Elliott, NE NW SE sec. 26-20-36. Location.
A. R. Eppenauer No. 1 Stuart, NW NE NE sec. 22-25-37. Drlg. 2,205 ft.
J. E. Farrell No. 2-C Walden, C SE SW sec. 15-22-37. Drlg. 3,700 ft.
Geo. F. Getty No. 1 Riggs, NW sec. 1-26-36. Wildcat; T.D. 3,295 ft.; 1,500 ft. O.I.H.; C.O.
Gulf Oil Corp. No. 1 Boyd, sec. 23-22-37. T.D. 3,681 ft.; testing.
Gulf Oil Corp. No. 3 Day, SE SE SW sec. 6-22-36. T.D. 3,850 ft.; testing.
Gulf Oil Corp. No. 1 Elliott, SW SE SE sec. 15-25-37. Drlg. 3,420 ft.
Gulf Oil Corp. No. 2-D Kutter, C SE SW sec. 8-19-37. Drlg. 3,920 ft.
Gulf Oil Corp. No. 1-D Mattern, SW sec. 6-22-37. T.D. 3,795 ft.; P.B. 3,779 ft.; drilling plug.
Gulf Oil Corp. No 3 McCormack, C SE SE sec 32-21-37. Drlg. 3,325 ft.
Gulf Oil Corp. No. 1 LeMunyon, C NE NE sec. 28-23-37. Old well; T.D. 3,666 ft.; pmpd. 3 B.O.P.D.
Gulf Oil Corp. No. 2 Ramsey, C SW SW sec. 27-21-36. T.D. 3,873 ft.; acidized.
Gulf Oil Corp. No. 1 J. Whitten, SE SE SW sec. 33-23-36. Rigging up.
Gulf Oil Corp. No. 1 Woolworth, C NE SE sec. 30-24-37. T.D. 3,803 ft.; P.B. 3,768 ft.; W.O.C.
Humble O. & R. Co. No. 4 Fopeano, C SE SE sec. 26-20-36. Cellar, pits.
Humble O. & R. Co. No. 2 Greenwood, C NE SW sec. 9-22-37. Derrick.
Humble O. & R. Co. No. 2-H State, C SE SW sec. 27-22-37. Loc.
Humble O. & R. Co. No. 3 Williams, C SW NW sec. 34-24-37. T.D. 3,532 ft.
Jal Nat. Gas Corp. No. 2 Justis, NE sec. 20-25-37. T.D. 3,029 ft.; testing.
Kan-Mex Corp. No. 2-B-3 Vaughn, NW cor. sec. 3-24-36. Drlg. 1,678 ft.
Carl B. King No. 1-A Stuart, NW NE NW sec. 14-25-37. Drlg. 3,425 ft.
Harry Leonard No. 1 Ginsberg, NW sec. 29-25-38. Wildcat; drlg. 3,600 ft.
Magnolia Pet. Co. No. 1 Brunson-Argo, C NW NE sec. 9-22-37. Plugging.
Magnolia Pet. Co. No. 1 State G, NW NW NE sec. 34-17-34. T.D. 4,905 ft.; P.B. 4,794 ft.
Magnolia Pet. Co. No. 1-J State, C NE SE sec. 22-17-34. Drlg. 2,350 ft.
Magnolia Pet. Co. No. 1-K State, C NW SE sec. 31-17-35. Drlg. 1,550 ft.
Magnolia Pet. Co. No. 2 State-Bridges, sec. 14-17-34. T.D. 4,593 ft.; flwd. 51 B.O. in 1 hr., naturally.
J. A. Mascho No. 1 Clovd, C SE SE sec. 20-22-23. Wildcat; T.D. 3,516 ft.; P.B. 3,211 ft.; drlg. 3,190 ft. in new hole.
C. T. McLaughlin No. 1 Polhamus, NE sec. 9-24-37. T.D. 3,672 ft.; drlg. plug.
C. T. McLaughlin No. 1 Imperial Royalties, NW SE NW sec. 9-24-37. Drlg. 3,570 ft.
National Drlg. & Prod. Co. No. 1 Flint, C NE NE sec. 29-20-34. Wildcat; drlg. 3,695 ft.
Ohio Oil Co. No. 1 Hardy, NE NE SE sec. 20-21-37. Drlg. 3,670 ft.
Ohio Oil Co. No. 1 Kutter D, C SW SW sec. 18-19-37. Drlg. 3,590 ft.
Ohio Oil Co. No. 7 State-McDonald, C SW SE sec. 16-22-36. T.D. 3,871 ft.; C.O.
Ohio Oil Co. No. 1 State-Staplin, C SE SW sec. 30-17-35. R.U.R.
Parker Drlg. Co. No. 1 Irwin, C W½ SW SW sec. 35-24-37. Drlg. 3,390 ft.
Phillips Pet. Co. and Pure Oil Co. No. 1 Woolworth, C SE NE sec. 33-24-37. T.D. 2,630 ft.; S.D. repairs.
Phillips Pet. Co. No. 2 New, CEL SE NE sec. 26-20-36. Rigging up.
Phillips Pet. Co. No. 2 Santa Fe, C SW SE sec 30-17-35. Drlg. 3,150 ft.
Phillips Pet. Co. No. 1 Santa Fe, C SW NW sec. 31-17-35. Drlg. 3,560 ft.
Plains Prod. Co. No. 1 Humphreys, NE sec. 3-25-37. Loc.
Repollo Oil Co. No. 3 Christmas, NW NW NE sec. 28-22-37. T.D. 3,726 ft.; P.B. 3,664 ft.; testing.
Repollo Oil Co. No. 4 Moseley, SW SE NE sec. 34-24-37. Drlg. 600 ft.
Repollo Oil Co. No. 4 Roach, NW NW SW sec. 21-20-37. T.D. 3,875 ft.; P.B. 2,860 ft.; shot; R.U.S.T.; S.D.O.
Repollo Oil Co. No. 3-C Stuart, SE NE SW sec. 20-25-27. O.W.D.D.; drlg. 3,392 ft.
Repollo Oil Co. No. 4-D Stuart, SW sec. 10-25-37. Drlg. 3,370 ft.
Repollo Oil Co. No. 3-B Whitten, NE SE NE sec. 4-24-36. Loc.
Shasta Oil Co. No. 2 Woolworth, NE NW NW sec. 28-24-37. Drlg. 1,212 ft.
Shell Pet. Corp. No. 1-A State, C NW SE sec. 16-23-36. T.D. 3,700 ft.; testing.
Shell Pet. Corp. No. 1-A State, NE cor. sec. 33-18-36. Drlg. 1,900 ft.
Shell Pet. Corp. No. 1-A State, C NW NE sec. 31-17-35. Derrick.
Shell Pet. Corp. No. 4-E State, C SW NW sec. 12-20-36. Drlg. 3,800 ft.
Shell Pet. Corp. No. 1 J. L. Whitten, NE SW SE sec. 33-23-36. Drlg. 1,410 ft.
Sindorf et al No. 1 Glier, NE cor. sec. 33-22-37. Drlg. 2,910 ft.
Skelly Oil Co. No. 5 J. B. Baker, C SE NW sec. 27-22-37. T.D. 3,620 ft.; testing.
Skelly Oil Co. No. 2 Hill, C NW NE sec. 6-21-37. T.D. 3,515 ft.; set 7-in. csg.; W.O.C.
Skelly Oil Co. No. 3 G. W. Sims, C NW NE sec. 9-23-37. T.D. 3,642 ft.; C.O.
Skelly Oil Co. No. 1-C R. R. Sims, sec. 3-23-37. Drlg. 3,688 ft.
Skelly Oil Co. No. 1-E W. P. Sims, C NW NE sec. 10-23-37. T.D. 3,625 ft.; flwd. 452 bbls. in 24 hrs.
Skelly Oil Co. No. 1-K State, NE NE NW sec. 32-21-37. Drlg. 2,655 ft.
Skelly Oil Co. No. 1 Toby, C SW SW sec. 7-24-37. Drlg. 3,100 ft.
Stanolind O. & G. Co. No. 2-A Hill, C NE SE sec. 6-21-37. Loc.
Stanolind O. & G. Co. No. 2-C Hill, C SW NW sec. 5-21-37. Drlg. 3,180 ft.
Stanolind O. & G. Co. No. 3-C Hill, C NW NW sec. 5-21-37. Cellar, pits.
Stanolind O. & G. Co. No. 4-B Myers, C SW NW sec. 21-24-37. T.D. 3,305 ft.; set 5½-in. 3,295 ft. W.O.C.
Sun Oil Co. No. 4 Stuart, C SE NE sec. 15-25-37. Drlg. 2,512 ft.
Texas Co. No. 1 Corbin, C NW SW sec. 19-18-33. Drlg. 4,460 ft.; 650 ft. O.I.H.
Texas Co. No. 3 Falby, C NE SW sec. 8-22-37. Drlg. 1,185 ft.
Texas Co. No. 3 Fristoe, NW SE NE sec. 3-25-37. Drlg. 2,964 ft.
Texas Pacific C. & O. Co. No. 8-A State, Acct. 2, C SE SE sec. 7-22-36. T.D. 3,578 ft.; running casing.
Texas Pacific C. & O. Co. No. 9-A State, Acct. 2, NW SW NE sec. 7-22-36. Drlg. 3,680 ft.
Tide Water Associated Oil Co. No. 2 Day, C E½ NW NW sec. 6-22-36. T.D. 3,782 ft.; W.O.C.
Western Gas Co. No. 1 Davis, C SW SE sec. 33-23-37. T.D. 2,603 ft.; set 8⅝-in. 2,577 ft.

Eddy County

F. E. Baker No. 1 Eddy, NE sec. 12-22-27. T.D. 2,117 ft.; S.D.O.
Barnett Oil Dev. Co. No. 1 King Permit, C NW SE sec. 23-26-30. T.D. 980 ft.; set 12½-in. csg. 974 ft.
Carper Drlg. Co. No. 3 Gissler, C E½ E½ NW sec. 23-17-30. Drlg. 1,160 ft.
Danciger O. & R. Co. No. 4-A Turner, C SW SW sec. 18-17-31. Rigging up.
Danciger O. & R. Co. No. 1-B Turner, CEL NE SE sec. 17-17-31. Loc.
D. & B. Oil Co. No. 2 Jenkins, SW NW NW sec. 20-17-30. T.D. 3,265 ft.; flwd. 20 B.O.P.D.
D. & B. Oil Co. No. 3 Jenkins, NE NE NW sec. 20-17-30. Loc.
Emperor Oil Co. No. 4 Puckett, C NE NE sec. 24-17-31. Drlg. 2,900 ft.
Emperor Oil Co. No. 5 Puckett, C SW NE sec. 24-17-31. Drlg. 1,910 ft.
Finley & Cherry No. 1 Buchley, C NW NW sec. 28-16-31. Wildcat; T.D. 3,750 ft.; S.D.
Flint Prod. Co. No. 1-B State, SE sec. 20-17-30. Drlg. 3,830 ft.
C. J. Frederick No. 1 Reed, C NE SW sec. 28-24-28. Drlg. 1,675 ft.
F. W. & Y. Oil Co. No. 8-A Gissler, NE NW NE sec. 23-17-30. Drlg. 2,770 ft.
F. W. & Y. Oil Co. No. 9-A Gissler, C SE NE sec. 14-17-30. Drlg. 1,800 ft.
F. W. & Y. Oil Co. No. 1-B Gissler, SW sec. 15-17-30. Drlg. 2,940 ft.
F. W. & Y. Oil Co. No. 3 Jackson, C NW SE sec. 13-17-30. T.D. 2,953 ft.; fsg.
Graybarg Oil Co. No. 11 Burch, NE NE SE sec. 19-17-30. Drlg. 2,112 ft.

F. W. & Y. Oil Co. No. 2-B Gissler, C NW NW sec. 24-17-30. T.D. 3,505 ft, S.&F. 135 B.O.P.D.; C.O. at 3,490 ft.
Grayburg Oil Co. No. 4 Keely, SE SW NE sec. 24-17-9. T.D. 3,290 ft.; S.D. repairs.
H. A. Hartwell No. 1 Vandagrift, NE NE SE sec. 8-18-27. T.D. 1,390 ft.; S.D. repairs.
R. L. Holcomb No. 1 State, NW sec. 22-17-28. Drlg. 1,520 ft.
C. F. Ingram No. 1 Page, NE NE SW sec. 15-21-28. T.D. 1,495 ft.; S.D. for new rig.
B. M. Koehane et al No. 1 Shannon, SE cor. sec. 27-16-31. Drlg. 2,700 ft.
Paul Moran No. 1 Crawford & Smith, NW NW SW sec. 24-24-26. Drlg. 835 ft.
Murchison & Closuit No. 2-A State, NW SE SW sec. 16-17-31. Drlg. 2,620 ft.
Pecos Valley Gas Co. No. 1 Sappenfield, C SE SE sec. 4-16-28. Drlg. 220 ft.
Red Gulch Oil Co. No. 2 Keyes, C SW SE sec. 4-17-28. T.D. 215 ft.; S.D. repairs.
Repollo Oil Co. No. 4-D McIntyre, NW NE NE sec. 21-17-30. T.D. 2,575 ft.; fsg.
Repollo Oil Co. No. 2-A Parke, NW NW NE sec. 22-17-30. Drlg. 1,370 ft.
Repollo Oil Co. No. 1-B Parke, SW cor. sec. 15-17-30. Drlg. 2,145 ft.
Paul Sargent No. 1 State, NE sec. 16-17-31. T.D. 3,749 ft.; P.B. 3,745 ft.; tstg.
R. A. Shugart No. 1 Coulthard, C NW SW sec. 35-18-31. T.D. 4,088 ft.; P.B. 4,040 ft.; tstg.
W. K. Royalty No. 2 State, C NW NE sec. 16-17-31. Drlg. 1,900 ft.
W. O. Snyder No. 1 Pecos Irrigation, C NE SE sec. 15-25-28. Drlg. 3,220 ft.

Western Drlg. Co. No. 1-A Western, SE SW NW sec. 23-17-29. Cellar and pits.
Martin Yates, Jr., No. 1 Conlon, SW NW NW sec. 7-24-27. T.D. 2,065 ft.; S.D.O.

Chaves County

E. J. Fisher No. 1 Etz Permit, NE sec. 23-7s-26. T.D. 1,500 ft.; salt water.
Grastorf & Caudill No. 1 Smith, C NE NE sec. 1-4s-29. Wildcat; drlg. 600 ft.
J. & L. Drlg. Co. No. 2 Hurd, SW sec. 11-11-26. Drlg. 625 ft.

Curry County

Bond & Harrison No. 1 Hart Ranch, C NW SE sec. 13-2n-31. T.D. 3,258 ft.; S.D.O.

De Baca County

Land Owners Oil Co. No. 1 McAdoo, SW cor. sec. 16-1s-7e. O.W. prep. to deepen from 5,850 ft.
James D. Ward No. 1 Summers, NW NE SW sec. 17-4n-20. T.D. 260 ft.; S.D.
N. F. Woods No. 1 Jones, C NE SW sec. 17-4n-20. T.D. 25 ft.; S.D.

Dona Ana County

Jules C. Bertrand No. 1 Casad Permit, sec. 24-26-5e. T.D. 47 ft.; S.D.O.

McKinley County

S. Dysart No. 1 Govt., NE sec. 14-14-10w. T.D. 1,390 ft.; fsg.

Otero County

Fred Turner, Jr., No. 1 Ella Everett, C SE SE sec. 34-22-13. Drlg. 3,000 ft.
Fred Turner, Jr., No. 1 H. V. Everett, SE SE sec. 28-22-13. Drlg. 1,700 ft.

Roosevelt County

C. S. Peterson and Conquistadores Oil Co. No. 1 Good, NW SE SE sec. 28-5s-30. T.D. 455 ft.; testing water shut off.

NORTHWEST NEW MEXICO

McKinley County

Claude Walker No. 6 fee, SE SW SE sec. 20-20n-9w. Drlg. 350 ft.

San Juan County

The Continental Oil Co. No. 71 Rattlesnake, CNL NE section 2-29n-19w, Rattlesnake field, was drilled to 794 feet and made 22 bbls. of oil and 29 bbls. of water. It was then plugged back to 763 feet to shut off water and was put on the pump.

Socorro County

Central New Mex. Oil Co. No. 1 Belen Ld. Grant, NW sec. 16-3n-1e. S.D. 2,700 ft. for csg.

Torrance County

Chief O. & G. Co. No. 1 Pace, SE sec. 12-6n-7e. T.D. 1,830 ft.; est. 1,000,000 ft. at 1,740 ft.

COLORADO

Archuleta County

Pagosa Oil & Dev. Co. No. 1 Macht, C sec. 32-36n-1w. Resumed at 328 ft. where it S.D. last December after landing 12½-in. on bttm.

Cheyenne County

The Gulf Oil Corp. No. 1 Union Pacific-Larson is preparing to resume drilling after stopping at 4,813 feet to test. At 4,808-10 feet oil showed through a hole full of drilling mud. Core drill was then run and 2½ feet of saturated core was recovered. The showing was so favorable that the 10-inch casing was run to the top of the horizon and preparations made for a test. After exhausting the water the oil failed to come in commercial quantities. The past week 2,000 gallons of acid was run. Tubing was then pulled to bail down and test, but it was found the string had parted above the packer and the acid did not penetrate the lime. At present it is fishing for the packer. When every precaution is taken in order not to overlook any possibility for production in this horizon, drilling will be resumed. The bottom still is from 1,500 to 1,800 feet above the original principal objective.

Gulf Oil Corp. No. 1 Union Pacific-Larsen, C SE NW sec. 13-13s-49w. T.D. 4,813 ft.; prep. to D.D.

Fremont County

Isadore Spangler No. 1 St. Mary's, SE SE SE sec. 2-19s-70w. Drlg. 185 ft.

LaPlata County

N. Spatter No. 1 Bryce, SE SW SW sec. 31-33n-9w. T.D. 1,510 ft.; sdtrkg.

Lincoln County

Consolidated Smelting & Metals Co. No. 1 Hancock, NE NE SW sec. 7-17s-52w. T.D. 2,888 ft. in red sdy. sh.; C.O. caves and W.O. csg.

Montezuma County

McElmo Oil Co. No. 1 West, NE NW NE sec. 31-36n-17w. Drlg. 4,100 ft.

Park County

South Park Oil Co. No. 1 Lemar, NE NE NE sec. 34-11s-75w. S.D. 5,735 ft.

SOUTHWEST KANSAS

Kuhn Brothers-Kinney-Coastal Oil Co. and others No. 1 Carpenter, C NW section 20-33n-36w, Hugoton field, Stevens County, was completed at 2,810 feet for 10,700,000 feet of gas per day. While in what was considered proven territory, it is in a district in which there has been comparatively little drilling. The associated interests have 1,900 acres in the block and have two other operations under way. Their No. 3 Carpenter, C SE section 28-33n-36w, is running casing at 2,600 feet, and their No. 2 Carpenter, C NW section 28, is rigging up.

WYOMING

Albany County

G. R. McConnell No. 1 Government (Thomas), CWL SW SE section 6-15n-75w, North Big Hollow, was completed in the Muddy sand at 890-920 feet for estimated 25 bbls. per day of 21-gravity black oil, after plugging back from 1,065 feet. It is a discovery. The location is north of the several wildcats drilled in that area by the Ohio Oil Co. and 4½ miles west and half a mile north of the Ohio No. 1 Styles, the nearest of the group, which tested the Tensleep at 3,003 feet and was abandoned.

The Wyco Oil Co., Inc., No. 3 Chappel, East Rock River district, after setting the 4¾-inch on bottom at 2,546 feet, perforated opposite the Lakota, topped at 1,890 feet, and hole filled with water. It will be cemented off and casing perforated opposite the Dakota, top at 1,762 feet, and test.

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Wyco Oil Co., Inc., No. 3 Chappel, NE NE NW sec. 33-21n-76w. T.D. 2,546 ft.; tstg.

Big Horn County

Prescott & Mileski No. 1 Govt., NE NW SW sec. 1-51n-93w. Drlg. 200 ft.
Clifford S. Johnson No. 1 Johnson, CEL NW NW sec. 24-51n-93w. Drlg. 219 ft.

Carbon County

The Ohio Oil Co.-California Co. No. 6 Union Pacific-Johnson, C SW SE section 23-21n-79w, an outside well on the northwest side of the Big Medicine Bow field, was completed for 1,500,000 feet of gas per day through the tubing from the first Sundance at 5,330-50 feet, after plugging back from 5,577 feet, where it had water in the second Sundance topped at 5,439 feet. Elevation is 7,126 feet. In an open-flow test through the casing it made 5,600,000 feet. It is a diagonal offset on the southwest to No. 3 Union Pacific, a producer in the Upper Sundance, and nearly half a mile to the northwest of No. 4-A Kyle, which looks like a big well. Last named, which is a west offset to the discovery, showed 20 bbls. in one hour on a drill-stem test at 5,445 feet after which it was deepened to 5,464 feet, still in saturated sand, and is drilling plug after cementing the 7-inch at 5,415 feet.

Italo Pet. Co. No. 1 Tunney-Bragg, NE SE NW sec. 11-26n-81w. Drlg. sdy. sh. 1,325 ft.; first Dakota dry at 1,276-1,310 ft.
Sinclair-Wyoming Oil Co. No. 12-B Wertz, SE NW NW sec. 7-26-89w. Drlg. 5,186 ft.
Ohio Oil Co.-California Co. No. 4-A Kyle, 661 ft. from N line and 648 ft. from E line, sec. 26-21n-79w. T.D. 5,464 ft.; cmtd. 7-in. at 5,415 ft.; drlg. plug.
Ohio Oil Co. No. 14 H.&C., SE NW SW sec. 35-20n-78w. Drlg. 2,550 ft.

Converse County

The New Era Fuel Co. No. 1 Mary Gasper, NW NW SW section 25-32n-69w, West Shawnee district, was abandoned at 870 feet. It had a show of oil at 719-25 feet. The New Era Fuel Co. No. 1 John Jones, SE SE SE section 21-32n-69w, was abandoned at 803 feet. The New Era Fuel Co. No. 1 Belle Layne, SE NW NE section 27-32n-69w, was abandoned at 761 feet. The Chadron-Osage Oil Co. No. 1 O'Meara, NE SE section 28-32n-69w, was abandoned at 800 feet, through the White River and into the top of the Lance. D. O. Gray No. 1 Lane, SW SE SE section 22-32n-69w, is shut down at 530 feet with a show of oil on top of a hole full of water.

Ainsworth Oil Co. No. 1 Marberger, NE SE NE sec. 34-32n-69w. T.D. 761 ft.; trying to S.O.W.
Chadron-Osage Oil Co. No. 1 State, SW SW SW sec. 16-32n-69w. T.D. 4,060 ft.; bailing to test; cmt. 8¼-in. at 4,040 ft.; S.G.
Wyshawn Oil Co. No. 1 Lindley, NW SE sec. 34-32n-69w. Drlg. 500 ft.

Fremont County

Sinclair-Wyoming Oil Co. No. 2-B Muskrat, NW NW NE sec. 4-33n-92w. Cg. in top first Wall Crk. at 4,143 ft.
Stanolind O. & G. Co. No. 1 Govt., C SE SE sec. 3-33n-96w. Cg. sh. at 8,075 ft.
Consolidated Oil Properties No. 3 Ewart, C SW SE sec. 16-1n-14w. T.D. 700 ft.; rng. form. test.

Hot Springs County

Delaware Oil Co. No. 1 Govt.-Skelton, C SE SE sec. 2-43n-96w. Cased off flow noninflam. gas at 270 ft. in Tensleep; drlg. 400 ft.
California Exploration Co. et al No. 1 Govt., NE SE NE sec. 12-44n-97w. Drlg. lead-wool plug at 3,807 ft.; to D.D.

Natrona County

The General Petroleum Corp. test on the Cole Creek structure, between the Big Muddy and Salt Creek fields, is preparing to test the First Wall Creek sand, from which bleeding cores were recovered. The total depth is 6,840 feet. It found saturation in intermittent sand lenses at 6,740 feet to bottom, with the principal sand body starting at 6,680 feet. The 8⅝-inch was cemented at 6,680 feet and plug was drilled yesterday. It is planned to run a Schlumberger today and that will be followed with a Halliburton test. While indications are favorable for a discovery and excitement is running high, particularly in Casper, it will be a day or two before results can be definitely known. On the Midway dome, to the west, the First Wall Creek carried water, while the second sand was productive. In Salt Creek, the second Wall Creek is the big producing horizon. The drill at Cole Creek did not go into the second sand. Close to 100 feet of First Wall Creek was drilled and so far there are no indications of water. The second Wall Creek is expected to be more than 100 feet thick at this location.

General Pet. Corp. No. 1 Govt., C NW SE sec. 21-35n-77w. T.D. 6,840 ft.; prep. to test.

Niobrara County

Three wells are near completions in the Minnelusa sands in the Lance Creek field, all of which are showing good saturation in cores. These are the Continental Oil Co. No. 3 Apex-1, the Argo Oil Co. No. 6 Ford, and C. L. Price No. 1 Lamb, the last named promising a slight extension on the west side.

Continental Oil Co. No. 5 Joss, SW SW NE sec. 6-35n-65w. R.U.R.; (first report).
Ohio Oil Co. No. 10 Putnam, NW SE NW sec. 4-35n-65w. R.U.R.
Argo Oil Co. No. 5 Ford, C SW SE sec. 33-36n-65w. Rig; W.O. tools.
H. D. Moore et al No. 1 Beregren, NW sec. 23-35n-63w. Drlg. 636 ft. in variegated sh.; (formerly W. A. Maupin et al).
Continental Oil Co. No. 3-A Diehlman, SE SE SW sec. 5-35n-65w. Drlg. r.b. at 4,185 ft.; top r.b. 4,185 ft.
Continental Oil Co. No. 3 Apex-1, SE SE NE sec. 34-36n-65w. T.D. 5,444 ft.; cmtd. 7-in. at 5,441 ft.; excellent sat. in top Leo sd. at 5,441-44 ft.
Argo Oil Co. No. 6 Ford, NW SW NW sec. 33-36n-65w. Cg. 5,312 ft. in sat. sd.; top Leo sd. 5,284 ft.
C. L. Price No. 1 Lamb, NE NW NW sec. 7-35n-65w. Cd. sat. in Leo sd. at 5,382-88 ft.; cmtd. 7-in. at 5,382 ft.; W.O.C.

Park County

Ohio Oil Co. No. 4 Mack-O.P.C.-4, SE SW SE sec. 30-58n-99w. T.D. 3,092 ft.; P.B. to 2,850 ft.; cmtd. 8⅝-in. at 2,790 ft.; tstg.
Resolute Oil Co. No. 4 N. P., C NE NW sec. 21-57n-101. Shot 40 qts. at 8,625-54 ft. in Frontier; C.O.; S.G., no oil.
Resolute Oil Co. No. 3 N. P., C NE NE sec. 20-57n-101w. Pmpd. 7 to 8 B.P.D. at 8,670 ft.; not officially. comp.

Sweetwater County

Sinclair-Wyoming Oil Co. No. 78, SW SW NW sec. 11-26n-90w. Drlg. 290 ft.; 20-in. at 56 ft.
Selegna Oil Co. No. 1 Union Pacific, SW SW sec. 11-20n-104w. Cg. 3,200 ft. in Frontier(?).

Weston County

Chas. F. Martens No. 8, SE SE NW sec. 24-46n-64w. S.D. 1,000 ft.; repairs.
Chas. Stough No. 10, SE SW NW sec. 4-46n-63w. Cased off S.O.&G. at 157 ft. and drlg. ahead.
Patterson Oil Co. No. 19, CSL SE SE sec. 17-46n-63w. Drlg. 225 ft.; commercial show at 152-225 ft.
John Brorphy No. 1 George, SW SE NW sec. 12-48n-64w. S.O.W. in Upper Minnelusa with csg. at 1,964 ft.; drlg. ahead.

MONTANA

Big Horn County

P. O. Oil & Gas Co. No. 1, NW NE NE sec. 25-9s-35e. Drlg. 340 ft.
E. L. Dana No. 1 Hardy, SW NW sec. 22-9s-35e. S.D. 700 ft.

Carbon County

R. C. Tarrant has moved in and is rigging up for a test on the Roscoe dome, about 20 miles to the northwest of the Dry Creek field. The operator has a block of 8,000 acres under 10-year commercial leases. The structure is well known and was drilled about 20 years ago by a subsidiary of the Prairie Oil & Gas Co., which had gas in the Frontier at 1,145 and 1,365 feet, but lost the hole at 2,520 feet. It is a rather large dome with a closure of 1,200 feet. Location was spotted by Joseph Irwin.

R. C. Tarrant No. 1, 500 ft. W of C sec. 3-6s-18e. R.U.; (first report).
R. C. Tarrant No. 2 Heare, NW SE NW sec. 14-6s-19e. T.D. 1,705 ft.; cmtd. cave at 1,300 ft.
Sha-Wa Pet. Co. No. 1 Govt., SW SW NE sec. 35-9s-23e. T.D. 3,123 ft.; P.B. to 3,063 ft. to S.O.W. and test Upper Dakota.
Miracle Oil Co. No. 2 Govt., CWL NE SE sec. 3-6s-23e. Drlg. 2,371 ft.; 5½-in. at 2,360 ft.

Glacier County

Texas Co. No. 1 Lindquist, C SE SE sec. 17-32n-5w. Cmtd. 10¾-in. at 550 ft.; Colo. 525 ft.
Glacier Prod. Co. No. 1 McNamer, CEL SE NE sec. 15-36n-5w. Drlg. 1,750 ft.; Colo. 395 ft.
Santa Rita O. & G. Co. No. 8 Tribal, C NE SW sec. 16-35n-6w. Drlg. 1,800 ft.
A. B. Cobb No. 1 State, C NE NE sec. 30-37n-4w. T.D. 2,592 ft.; S.D. until spring.
Santa Rita O. & G. Co. No. 3 Govt., C SW SW sec. 4-32n-5w. Spdg.; (first report).

Hill County

Burton & Hole No. 1 Waldrip, C SW NW sec. 12-32n-17e. Drlg. 330 ft.

Lewis and Clark County

Lewis & Clark Oil Synd. No. 1 Heilman, NW NW SW sec. 11-18n-5w. Drlg. 1,950 ft.

Toole County

Chas. Grant et al No. 1 Anderson, SE NE NE sec. 26-35n-4w. Drlg. 1,980 ft.; top Sunburst 1,847 ft.
R. G. Parrent No. 1 Anderson, C SW SE sec. 26-35n-4w. Drlg. 1,550 ft.
B. A. S. Arnow No. 1 Govt., SE SE SW sec. 18-35n-2w. T.D. 1,644 ft.; contact 1,643 ft.; 125 ft. W.
Big West Oil Co. No. 6 Gunderson, NE NW NW sec. 19-35n-2w. T.D. 1,550 ft.; cmtd. 6⅝-in.; W.O.C.
Superior Pet. Co. No. 7-A, NE NW NW sec. 12-35n-3w. Skdg. rig from No. 7.
West Kevin Community Lease, Inc., No. 1 McClary, SW NE NW sec. 3-34n-4w. Drlg. 1,300 ft.

Yellowstone County

Broadview Dome Oil Co. No. 1 Stallinberger, NE NE SW sec. 18-3n-23e. Cg. 4,561 ft. in Madison.
Riverton Oil Co. No. 1 Fox, CEL NW NE sec. 14-2n-23e. T.D. 1,795 ft.; cmtd. 8¼-in. on bttm.; W.O.C.

UTAH

Grand County

Utah Southern Oil Co. No. 1 Hyde, SE NW NW sec. 33-22s-22e. T.D. 6,715 ft.
Columbia Crude Corp. No. 1 Rath, NW SW SE sec. 12-25s-20e. Drlg. 3,390 ft. in hd. salt.
Cane Creek Oil Co. No. 1 Govt., NW SW sec. 31-26n-21e. Drlg. below 1,000 ft.

Summit County

Longwell Pet. Co. No. 1, SE SW SE sec. 35-3n-5e. Drlg. 2,650 ft.

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Eastern Field Report

By STAFF CORRESPONDENT

Fayette County Gas Test Is Showing in Onondaga Lime

PITTSBURGH, Pa., Mar. 14.—The test of the Potter Development Co., William E. Snee and others on the Summit Hotel lease on Chestnut Ridge in South Union Township, Fayette County, Pennsylvania, is showing some additional gas at 6,710 feet. The top pay was at 6,696 feet where there was a showing of 31,000 feet a day. At 6,704 feet, the well gauged 75,000 feet a day, and at 6,710 feet, 111,000 feet a day. The Onondaga was topped somewhere between 6,625 and 6,640 feet, and the top of the chert between 6,657 and 6,686 feet. The lime was very hard and contained chert and considerable quartz. The formation has hardened considerably with depth, so much so that progress has been limited to about 1 foot in eight hours.

In Clay County, West Virginia, the Pittsburgh & West Virginia Gas Co. test, on the Jesse Chapman farm in Otter district, Clay County, is 23 feet in the Oriskany sand, topped at 6,319 feet, and is a failure so far. It is east of the Chestnut Ridge anticline, a quarter of a mile up the first north fork of Boggs Fork, east of Latitude 81 degrees.

In Newport village, section 27, Newport Township Washington County, Ohio, Pickens and Waldschmidt completed No. 10 Emily Adkins in Berea grit at 1,775 feet and it produced 75 bbls. the first day, and was not shot. It also produces about 30,000 feet of gas per day from a shallower formation. The well is still flowing at intervals.

In Athens County, the Kackelmacher Estate completed a test on the Harry Jackson farm in section 10, York Township, in Berea sand at 926 feet. It is a gas well gauging 280,000 feet a day.

SOUTHWEST PENNSYLVANIA

In Allegheny County, Pennsylvania, Hope Construction & Refining Co. deepened No. 4 C. G. Mallise in Plum Township, to 3,911 feet where it was showing 40,000 feet of gas a day from the Bradford sand.

In Indiana Township, Allegheny County, Rodgers Development Co. drilled No. 6 J. H. Johnston through the Fifth sand to 2,435 feet and it is a dry hole.

In Robison Township, Allegheny County, Getty and Purdy completed a light gas well on the R. Bennett farm in the Hundred Foot sand. In Ross Township, Wally and others have a gas well on the Hunter lease also in the Hundred Foot sand.

In Ross Township, O. Miller No. 3 Werner was dry in the Hundred Foot, and is drilling at 2,000 feet. Heck & Co. are drilling at 2,000 feet on the Wattensoldos lease. Updegraph and others have reached 500 feet in No. 2 Warbloc. In Penn Township, South Penn Oil Co. is drilling on the Jane Ryan farm and have reached 600 feet.

In Beaver County, Lewis Sarver is drilling a test on the L. Sarver farm in Hanover Township, and is in the Berea. In Greene Township, Oak Oil & Gas Co. No. 4 Mary M. Bartley is drilling at 100 feet.

Washington County

In Buffalo Township, Washington County, F. Chivers and others have started a test on the A. Provenzano farm. In Morris Township, the Duquesne Gas Co. is drilling at 2,924 feet in the J. E. Day test with the Fifty Foot sand topped at 2,880 feet, and 100,000 feet of gas at 2,880-90 feet.

In Somerset Township, Wherry-Polonis and others were drilling at 2,795 feet on the Joseph Polonis farm. The Thirty Foot sand was at 2,427-65 feet, with 20,000 feet of gas in the bottom of that formation, and Bayard sand at 2,770-84 feet, with 100,000 feet of gas at 2,778 feet. In this township, Furman Nuss and others were drilling at 2,960 feet on the R. C. Garber farm, with the Fourth sand at 2,665-85 feet good for about 40,000 feet of gas.

In Amwell Township, Carnegie Natural Gas Co. completed No. 4 N. B. Redd after the fire, and it is a gas well at a total depth of 2,672 feet. In Nottingham Township, Keystone Drilling Co. was down 745 feet on the J. M. Balentine farm.

Greene County

In Center Township, Greene County, South Penn Oil Co. was lowering casing to 2,445 feet in No. 12 Samuel Harvey with the top of the Big Injun sand at 2,315 feet. Carnegie Natural Gas Co. pulled the casing in No. 3 J. H. Orndoff for repairs after reaching 2,290 feet. J. B. Orndoff has rigged up No. 2 G. M. Scott.

In Washington Township, the Equitable Gas Co. was drilling at 1,263 feet in No. 2 Sadie A. Connor. In Greene Township, O. I. Dille is drilling at 1,670 feet on the Jacob Livingood farm. In Richhill Township, W. L. Walters is down 415 feet in the Harry Clutter test. Smith McCracken is drilling by the tools lost at 3,100 feet in the test on the Asa Hughes farm.

Deep Tests

On Chestnut Ridge in Wharton Township, Fayette County, Greensboro Gas Co. is drilling at 2,550 feet on the J. R. Thompson farm which is scheduled for the lower Devonian. A 10-inch hole is being carried. Fox and Foley are the contractors. In North Union Township, Wasson & Co. are drilling at 1,162 feet on the J. H. Sorg farm with a 13-inch hole at present, and water in the hole. Formations are being tested to find a base to run casing and shut off the water. Fairman Brothers are the contractors.

WEST VIRGINIA

In Wetzel County, West Virginia, Green district, O. T. Midcap and others completed the Stephen Midcap test in the Third Salt sand at 1,850 feet and it is making 30 bbls. a day. It may be slightly deepened.

In Pleasants County, W. V. Proper and others test on the George Hashman farm in McKim district, got the Injun sand at 1,790 feet, and is showing for 3 bbls. a day.

In Wood County, the Wamsley Oil & Gas Co. completed the test on the C. W. Stagg farm in Union district in the Maxton sand at 1,782 feet and it is a 1-bbl. pumper along with 50,000 feet of gas a day.

In Lincoln County, an unreported test completed earlier of H. H. Dial on his own fee in Sheridan district, places the Big Lime at 1,200 feet with a total depth of 1,260 feet and about 20 bbls. a week production.

Gas Wells

In Cabell County, G. T. and Guy B. Ray completed a test on the General Savage farm in McComas district at 3,588 feet. Brown shale lay at 2,925-3,580 feet, with 237,000 feet of gas in the shale. In this district, R. H. Morris completed a B. F. Morris test at 3,542 feet. Brown shale was at 2,852-3,542 feet, with 65,000 feet of gas in the shale, after a shot. In the same district, H. L. Skidmore and J. C. Jett completed a gas well on the L. D. Kress farm, Brown shale at 2,635-3,552 feet yielded 924,000 feet of gas per day. The top of the Corniferous lime was at 3,553 feet.

In Calhoun County, Gerwig & Kothe Co. completed No. 15 Hardman in Center district. It was bottomed in the Injun sand at 2,052 feet and has a gauge of 1,300,000 feet a day without a shot. In Washington district, Jeff Miller and others completed a second test on the H. G. Brannon farm at 2,235 feet. The Big Injun sand lay at 2,133-91 feet. It yielded 240,000 feet of gas per day without shot.

In Gilmer County, C. F. Wilson and others test on the Fred Whiting and others lease in Glenville district at 1,603 feet, gauged 988,000 feet a day from pay at 1,545-52 feet. In this district, the test of C. F. Wilson on the Ray Kirkpatrick farm was dry at 1,590 feet, with the Big Injun at 1,538-85 feet.

In Center district, Gilmer County, Phil D. Phillips completed a second test on the W. B. Wilson farm in Injun sand at 2,097 feet. It gauges 180,000 feet a day without a shot. In DeKalb district, the J. A. Jefferies No. 2 K. F. Ermlich was dry through the Injun sand to 1,788 feet.

In Logan County, the Southeastern Gas Co. test on the John A. Covey Heirs farm in Logan district is a gas well at 2,926 feet. The gas from the Big Lime gauged 295,000 feet a day; from the Big Injun 70,000 feet; Berea grit, 15,000 feet, or a total of 556,000 feet a day with a shut-in pressure of 925 pounds.

In Monongalia County, J. A. Cummins and M. R. Phillips completed a second test on the Louisa Cummins farm in Bettelle district at 3,165 feet. It produces from the Fifth sand with a final gauge of 425,000 feet a day.

In Ritchie County, Mud Lick Oil & Gas Co. deepened No. 2 R. M. Brissey in Union district to 1,918 feet, the Injun sand and it is a gas well gauging 787,000 feet a day. In Murphy district, the Costadon Oil Co. drilled No. 3 Albert Carpenter through the Injun sand to 2,170 feet and it is dry and abandoned. Hope Natural Gas Co. deepened No. 963 Andrew Jordon, to 2,105 feet, Injun sand, and it was dry and abandoned.

In Roane County, L. L. Reed and others completed a test on the T. B. Ferrell farm in Harper district in the Salt sand and have a gas well gauging 500,000 feet a day.

In Wayne County, Bazil Burgess Gas Co. second test on the L. and M. Lester farm in Union district, is a gas well at 3,351 feet. Brown shale at 2,790-3,350 feet yielded 200,000 feet of gas. The Corniferous lime was topped at 3,350 feet.

In Wetzel County, Carnegie Natural Gas Co. completed a fair well on the R. E. L. Simmons farm in Proctor district. Total depth was 1,875 feet with the Maxton sand topped at 1,845 feet and 1,845,000 feet of gas a day at 1,865-75 feet.

Oriskany Gas Field

One fair well was completed in the Oriskany gas pool in Kanawha County. In Poca district, the Mullins Gas Co. completed a test on the Della M. Faber and others lease at 4,895 feet with the Oriskany topped at 4,881 feet and a gauge of 19,195,000 feet a day.

Final gauges on the test of the Columbian Carbon Co. on the Nora Hamilton farm was 285,000 feet a day, total depth 5,253 feet, and Oriskany topped at 5,169 feet. This is in Elk district. In Poca district, the final gauge of the Hays Oil & Gas Co. on the Harry L. Evans test was 9,971,000 feet a day, with a total depth of 4,970 feet.

In Elk district, Columbian Carbon Co. located a test on the B. F. Jones farm. In Poca district, the Mullins Gas Co. made a location for a test on the Esta Fisher Bonham farm.

In Poca district, United Fuel Gas Co. has a fishing job 15 feet in the Oriskany sand in No. 4779 on the A. A. and William Beane farm. The sand was topped at 4,912 feet with a showing of 657,000 feet of gas. In this district, the same company topped Corniferous lime at 4,955 feet in No. 4785, Otto B. Johnson farm. This company is drilling at 1,845 feet in No. 4771, B. A. Sisson land; at 1,850 feet, No. 4784, Oscar L. Gibson; at 600 feet, No. 4790, W. H. Sisson land. The United Carbon Co. is fishing for bailer at 4,845 feet on the Eulah Miller and others land; drilling at 2,500 feet in the William R. Young test, and at 1,500 feet in the James S. Fisher test.

Joe Rubin has started drilling on the Carney Heirs farm. Pitmar Gas Co. is at 4,445 feet in the Albert Moore test. Godfrey L. Cabot, Inc., is down 3,685 feet in No. 1 G. G. Dawson. The Glenn Oil & Gas Co. has spudded in and started drilling the No. 2 James A. Haynes. D. H. Stephenson & Co. have started

(Continued on Page 130)

North Louisiana, Arkansas

By GEORGE WEBER

Arkansas New Pool Assured; Large Well in Sabine Parish

SHREVEPORT, La., Mar. 14.—With the final production test being made on Kerr-Lynn Oil Co. No. 1 Barnett, the discovery of a new South Arkansas oil field is assured. This outstanding event of the week attracted much attention, and leasing play in the general vicinity of the wildcat is active, although acreage is fairly closely held.

The Sabine Parish deeper-sand discovery in the Blue Lake area, Sutton-Zwolle Oil Co. No. 1 Sabine Lumber Co. as yet not completed, but is a big well. Other events of importance were the completion of additional Holloway sand production in the Cotton Valley field of Webster Parish, Louisiana, and a separate classification given the Jefferson-Lodi area of Marion County, East Texas.

Kerr-Lynn Discovery

In the vicinity of the towns of Magnolia and Village, Ark., the new South Arkansas discovery, Kerr-Lynn Oil Co. No. 1 Barnett, section 14-17-20, was tested Sunday and made 46 bbls. of oil the first hour, 38 bbls. the second hour. The pressure gradually died down. It flowed through casing. The well was closed in Sunday night to allow the pressure to build up. Early Monday the swab was run 6,500 feet, recovered fluid, 95 per cent salt and sulfur water. This was blamed on the poor condition of the hole. A new oil field was conceded. The wildcat cored hard slightly porous lime at 7,659-64 feet several weeks ago, and after mechanical difficulties set 7-inch casing at 7,052 feet with total depth of 7,664 feet. Later the test was cored to 7,730 feet and a drill stem test made at 7,664-72 feet showed 5,400 feet of salt and sulfur water in 27 minutes on three-eighths inch chokes, top and bottom. The hole was carried to 7,740 feet and an electric log run. Operators then set 5-inch casing at 7,720 feet.

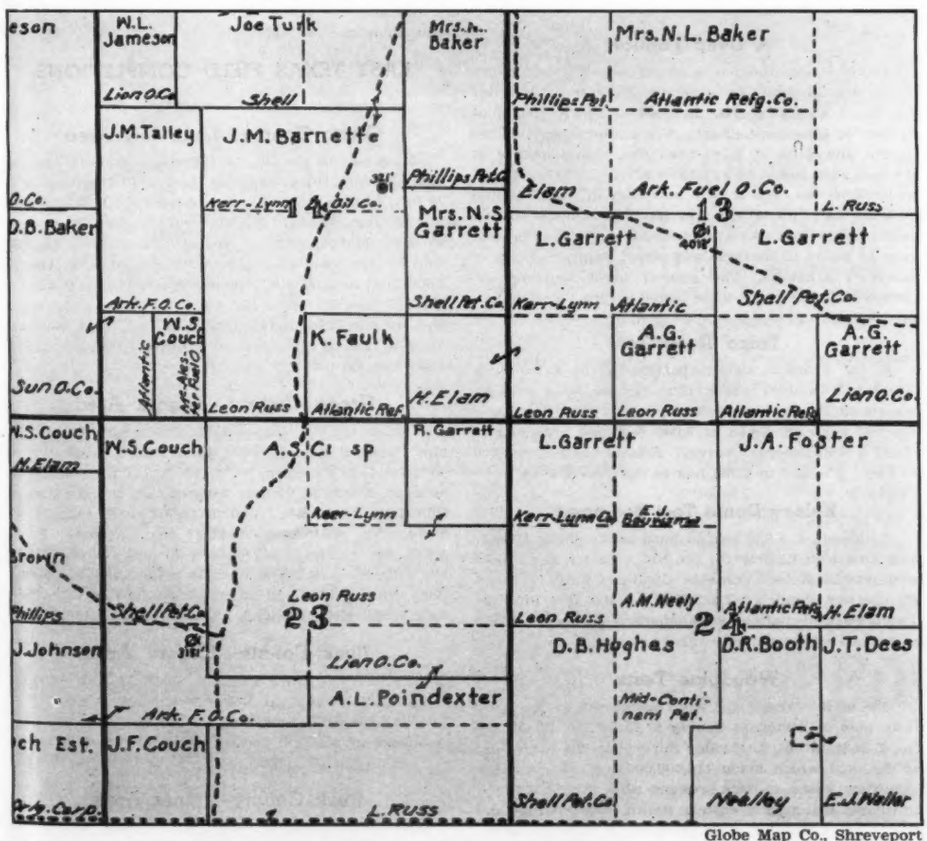
A week ago the casing was perforated at 7,623-51 feet and after running the bailer twice, the well came in making oil and wash water. It cleaned for about 15 minutes, after which it was killed, while operators repaired a cracked casing connection. The gravity of the oil is 36.8 degrees.

The discovery is enhanced by its position in a trend of two other lime production areas in South Arkansas. To the northwest approximately 18 miles is the new Buchner field, which is producing from the lime at 7,250 feet. The Shuler field, which has production in the Lower Marine as well as the lime, termed locally the Reynolds lime at 7,650 feet, is located approximately 15 miles to the southeast. Considerable wildcat exploration is expected as a result of the success of the Kerr-Lynn wildcat, as well as increased activity in the immediate vicinity of the new prospective producer.

Big Well in Prospect

At the Sutton-Zwolle Oil Co. No. 1 Sabine Lumber Co. test in the Blue Lake area of Sabine Parish, plug was drilled on Sunday with a small rock bit on tubing. The bit reached the float valve and the well tried to blow out. Christmas tree was installed and the pressure on the tubing rose to 800 pounds. It flowed into pits for 15 minutes at an estimated open flow rate of 10,000 bbls. per day. It was closed in. The hole was not entirely cleaned. Storage tanks are moving in today. The deep test is located south of a group of shallow wells which have been abandoned. It showed a recovery of 1,200 feet of pipe line oil in nine minutes last week at 3,843-53 feet using quarter-inch top and 3.8-inch bottom chokes. A working pressure of 275 pounds was reported.

Operators have set 7-inch casing at 3,846 feet and a steel line measurement showed the total depth to be 3,865 feet. Completion tests on the important well were delayed for title work. The test is on a 10,000-acre block, its exact location being SE cor. NW NE section 23-7n-14w.



Globe Map Co., Shreveport

The acreage immediately around the new Kerr-Lynn discovery well in Columbia County, South Arkansas is held by a number of major companies and independents. Considerable drilling is expected to result from a successful completion of Kerr-Lynn No. 1 Barnett

Estimated Daily Production

Estimated daily gross production all companies week ending March 12:

NORTH LOUISIANA

	Barrels
Bellevue	685
Caddo light	3,860
Caddo heavy	2,415
Converse	575
Cotton Valley heavy	150
Cotton Valley light	*6,470
De Soto and Red River	1,255
Elm Grove	335
Haynesville	3,030
Holly	80
Homer	2,570
Lisbon	9,890
Pleasant Hill	110
Rodessa	42,345
Sarepta-Carterville	295
Sligo	710
Sugar Creek	355
Urania	2,785
Zwolle	875
Total	78,790

SOUTH ARKANSAS

Buckner	200
Champagnolle	1,190
El Dorado	1,850
Lisbon	270
Miller County	400
Nevada	670
Rodessa	7,790
Shuler	15,525
Smackover light	2,000
Smackover heavy	16,000
Stephens	560
Troy	1,290
Urbana	1,185
Total	48,930

Texas side of Rodessa field 35,510 bbls. daily.

*4,970 bbls. is distillate.

Rodessa

The tri-state Rodessa field gained four new producers during the week. In the Caddo Parish section, Standard Oil Co. of Louisiana completed No. 1 Rodessa Oil & Land Co., NE cor. NE NE section 10-23n-16w, for an initial production of 455 bbls. per day on a 25/64-inch choke. Casing pressure was 700 pounds and tubing pressure 425 pounds. Total depth is 5,968 feet.

In the same section, Union Producing Co. No. 7 Harris came in making 210 bbls per day on an 18/64-inch inch choke, with tubing pressure of 700 pounds and casing pressure of 1,000 pounds. Porous lime was cored at 5,923-44 feet and 7-inch casing was set at 5,934 feet. Total depth is 5,950 feet.

Cass County, Texas, had one completion, Union Producing Co. No. 5 Bangus Unit, in the Tromwell Survey. The new well made 115 bbls. per day on open tubing with flow valves and 375 pounds of input gas. The total depth is 6,007 feet.

Miller County, Arkansas, also gained one well, G. C. Grasty No. 1 Mitchell, section 11-20-28, which flowed 484 bbls. in 22 hours on a half-inch choke, with tubing

(Continued on Page 138)

North and East Texas

By MITCHELL TUCKER

K. M. A. Outposts Test Pay; 9,951-Foot Hole Is Failure

WICHITA FALLS, Tex., Mar. 14.—Among the several important extension tests in the K.M.A. field now in the testing stage, the possible 3-mile westward outpost from production remains the highlight. Bolin & Whittington No. 1 Waggoner in the H.&T.C. Survey about 3 miles out from west side production, picked up the Kemp City lime favorably, and drilled a saturated section at 3,940-70 feet. Electrical survey indicated good porosity in this zone, and casing has been set at 3,835 feet for testing.

The Joe Worsham well, northernmost producer and outpost between Kemp City and Electra in the K.M.A. field, is now the center point for several important outposts on all sides, and the Bolin & Whittington well is about 4 miles southwest of this producer. One mile to the south, W. H. Peckham and associates No. 1 N. H. Martin in the B.S.F. Survey is preparing to run pipe after coring good saturated section from 3,766-99 feet. An oil well here would serve to definitely link up the producing area with the Worsham outpost. In the other direction toward Electra, 3 miles northwest of the Worsham producer, Clark & Cowden No. 1 W. T. Waggoner, the A. Gibson Survey, is coring in the Kemp City lime below 3,850 feet and reporting some saturation.

The field's Ordovician prospect, F. W. Merrick and others No. 1 Waggoner, section 35, Block 5, H.&T.C. Survey, has set casing at 3,740 feet and is moving in cable tools to test the showings found in the Ellenburger at 3,733-95 feet. Location is 2½ miles southwest of the Rathke Oil Co. No. 1 Burnett producer in the northern portion of the field.

Three and one-half miles southeast of Electra, Rathke Oil Corp. No. 1 W. B. Throckmorton, section 1, J. F. Torry Survey, and one location north of its No. 1 Burnett producer, is preparing to drill plug and test at 3,493 feet.

The Archer County portion of K.M.A. is not without its important possible extensioners now in the process of completion. Six miles southeast of production the Hull & Silk and others No. 1 Wilson, A.T.N. C.L. Survey, cemented casing at 3,835 feet for testing of the saturated section at 3,841-58 feet. Lewis Production Co. No. 1 W. S. Frey, Block 17, Palo Pinto School Lands, also in Archer County, is cleaning out after acidizing at 3,978-82 feet with 2,000 gallons.

Bert Ligon & Huff No. 1 C. Collins, T. J. Tyler Survey, and 4 miles west of Wichita Falls, is bailing preparatory to drilling plug at 4,290 feet. Oil saturation was reported at 4,308-18 feet. Location is about 10 miles northeast of the K.M.A. field.

Considerable interest is being shown in Lloyd H. Brown No. 1 Waggoner, section 33, Block 6, H.&T.C. Survey, Wilbarger County. Despite showings of salt in the sand at 4,100-07 feet, no salt water has been bailed since the cement plug was drilled. Drilling continues below 4,170 feet. This test is 4 miles west of production.

A possible new deep producing area was indicated southwest of Vernon in Wilbarger County. Brashear Drilling Co. No. 1 T. J. McGill, found saturated oil sand from 3,768-88 feet, and is now preparing to run casing. Location is in section 3, Block 9, H.&T.C. Survey.

Check of records in Wilbarger County reveals that more than 210,000 acres of this county's 600,000 acres have been placed under lease in one of the greatest leasing plays the county has known since the boom 20 years ago. Most of the acreage is believed to be in the trend of the rapidly expanding Kemp City lime.

Cooke County

A 1-mile outpost to the Anderson-Kerr field in Cooke County just east of Gainesville, appeared more encouraging last week. Robert Craise and others No. 1 H. P. Ware, A. C. C. Bailey Survey, with a total depth of 2,224 feet, has successfully recemented pipe and apparently shut off upper water which was shutting off the original showings of 38-gravity oil. Following the setting period, tests will be made.

Sinclair Prairie Oil Co. is rigging up its Ellenburger lime test in the Horseshoe Bend area on the J. M. Best tract. Contract depth is 7,000 feet.

Denton County

The Bolivar pool of northwestern Denton County is receiving a new test by Lide & Greer No. 1 W. E. Forrester in the O. Wilcox Survey, having the 1,600-foot sand as the objective. The discovery well, A. A. Lander No. 1 Ed Forrester, Barrough Survey, is being reconditioned in an effort to revive production. Lander is reported to be planning a 4,000-foot exploratory test of this structure in the near future.

EASTERN TEXAS FIELDS

DALLAS, Tex., Mar. 14.—The Flag Lake field in northwestern Henderson County remains the center of interest in Eastern Texas following the estimated 2,500-bbls. initial flow made by the field's second completion, Hines and others No. 1 Dillard, from Woodbine sand 3,064-68 feet about 10 days ago. As yet, official gauge has not been taken on this well. The third well for the pool was indicated last week as an eastern offset to the discovery well. Hunt, DeArman and McMillan No. 2 Dawdy found saturated sand from 3,085-90 feet, total depth, and casing will be set for production tests.

A Deep Failure

Probable abandonment of the deepest well in Eastern Texas was in sight last week for Stanolind Oil & Gas Co. No. 1 Tenny Norris. Located in the K. Thrasher Survey of Limestone County, this exploratory well has logged anhydrite at 9,785-9,845 feet, Conglomerate at 9,845-88 feet, red sand at 9,888-9,932 feet, cherty gravel at 9,932-40 feet, and is now bottomed in Conglomerate at 9,951 feet. Some attempts have been made to correlate the lower rocks drilled in this well with Permian lime as found in the new and active deep producers of southern Arkansas. The several small showings recorded while drilling will be tested before abandonment of the hole.

Talco Deep Test

In the Franklin County portion of the Talco field, Ajo No. 1 Sanders, which thus far has been a disappointment in seeking production from the Glen Rose, reached contract depth of 5,900 feet and arranged to make a Schlumberger survey. Efforts are being made to carry it ahead to 6,000 feet in the Travis Peak.

Kelsey Dome Test Bottomed

Bottomed at 7,935 feet in hard sandy shale, Hunter and American Liberty Oil Co. No. 1 Carter, deep prospect on the Kelsey dome in Upshur County, reached its contract depth of 7,933 feet or 400 feet into the Travis Peak formation. Schlumberger has been run and operations are suspended awaiting orders.

Woodbine Tests

One of the largest gas wells completed in the Long Lake pool of Anderson County is the F. H. E. Oil Co. No. 1 J. Brantley, J. Madden Survey, in the north end of the pool which made 115,000,000 feet of gas daily, open flow, based on back pressure tests from 5,332 feet. In Chapel Hill area of eastern Smith County, Hunt and others No. 1 Bradley, deep prospect, is waiting for cement to set after setting 15½-inch casing at 495 feet. Southeast of Tyler, Mayo, Housh & Thompson No. 1 Mayfield is drilling shale and lime below 2,555 feet. Lone Star Gas Co. No. 1 Sarah Melasky, in the Buffalo gas area of Leon County, is making small amounts of gas and distillate from 5,630-70 feet, while testing. Failure was recorded for E. B. LaRue and others No. 1 Breedlove-Mills, Woodbine sand wildcat in the J. Dunn Survey, Henderson County, last week. The test topped

EAST CENTRAL TEXAS COMPLETIONS

Anderson County

Tide Water No. 6-B N. M. Wills, 3,904-76 feet, 85,000,000 feet gas.

Cherokee County

Bunn Drilling Co. No. 1 J. H. Bowling, dry and abandoned at 4,071 feet. Lyde & Greer No. 1 Tankersly, dry and abandoned at 5,062 feet.

Franklin County

In the Talco field, Humble Oil & Refining Co. No. 8 Dawson, 4,154-4,315 feet, 170 bbls. per day.

Henderson County

Harper & Turner No. 2 Barton, 4,015-43 feet, 24 bbls. per day.

Hill County

Bells Oil, Inc., No. 1 Freeland, dry and abandoned at 1,490 feet.

Navarro County

Natural Petroleum Co. No. 1 Karen Brown, dry and abandoned at 1,737 feet.

EAST TEXAS FIELD COMPLETIONS

(One-hour gauges)

Gregg County—Longview Area

Gilcrease Oil Co. No. 11 Christian, 3,565-91 feet, 96 bbls. Humble Oil & Refining Co. No. 49 Hughes, 3,675-79 feet, 44 bbls. Magnolia Petroleum Co. No. 33 Everett, 3,644-50 feet, 80 bbls.; No. 21 W. E. Jones, 3,666-85 feet, 80 bbls. Margay Oil Co. No. 10 T. Christian, 3,675-86 feet, 72 bbls. Shell Petroleum Corp. No. 20 J. W. Aikens, 3,569-3,641 feet, 60 bbls. Sinclair Prairie No. 22-B Aikens, 3,655-67 feet, 25 bbls.; No. 50 M. Moncrief, 3,591-3,709 feet, 40 bbls. Stanolind Oil & Gas Co. No. 8 Willhite, 3,613-85 feet, 58 bbls. Sun Oil Co. No. 41 Haynes, 3,594-3,674 feet, 60 bbls.

Gregg County—Kilgore Area

Cal-Tex Oil Co. No. 5-A L. D. Crim, 3,578-81 feet, 40 bbls. General American No. 14 D. Smith, 3,565-66 feet, 80 bbls. Gulf Oil Corp. No. 6 W. B. Goyne, abandoned location.; No. 12 A. Nichols, 3,686-92 feet, 10 bbls. Henery Oil Co. No. 12 S.S.&B. Laird, 3,540-60 feet, 72 bbls. M. W. McVey No. 4 Dickson, 3,523-37 feet, 30 bbls. P. L. Miller No. 2 Crim, 3,545-80 feet, 50 bbls. Nioco Oil Co. No. 8 Knowles, 3,548-66 feet, 35 bbls. Shell Petroleum Corp. No. 8 Sibley and others, 3,583-3,600 feet, 75 bbls. Tide Water No. 36 Hughey, 3,502-30 feet, 72 bbls.

Rusk County—Kilgore Area

Kathleen Oil No. 9 Peterson, 3,627-52 feet, 50 bbls. Magnolia Petroleum Co. No. 16 Bradberry, 3,620-21 feet, 30 bbls. James T. Smith No. 5 L. Morse, 3,560-72 feet, 40 bbls. Stanolind Oil & Gas Co. No. 10 Christian, 3,670-81 feet, 39 bbls.

Rusk County—Joiner Area

Atlantic Refining Co. No. 2-E C. Young, 3,652-3,749 feet, 30 bbls. Gulf Oil Corp. No. 18 Thrash, 3,722-33 feet, 60 bbls. Humble Oil & Refining Co. No. 57 W. L. Price, 3,711-32 feet, 65 bbls.; No. 61-A R. E. L. Silvey, 3,697-3,709

(Continued on Page 134)

KANEWELDING CASING STRING No. 2000!

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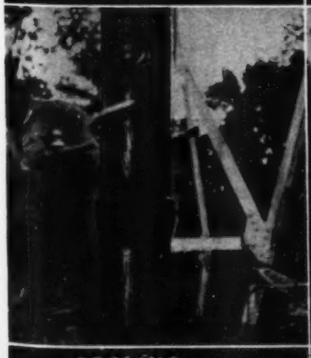

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Texas and Louisiana Gulf

By
NEIL WILLIAMS

Major Fairbanks Extensions Are Indicated in Two Tests

HOUSTON, Tex., Mar. 14.—Development of the newly opened Fairbanks field, Harris County, continues to hold the attention of operators along the Gulf Coast district as two outposts indicate major extensions. E. L. Smith and Ownby Drilling Co. No. 1 Meyers, a half mile east and slightly north of the discovery well, perforated casing at 6,833-41 feet and 6,844-52 feet. It is flowing into the pit with no gauge available. It was showing 1,850 pounds pressure on the tubing and 2,500 pounds on the casing. The sand section was topped at 6,313 feet, and a 24-foot section was cored to the total depth of 6,840 feet. One and one-half miles southeast of the discovery, H. E. Williams No. 1 Vega, G. Williams Survey, was running 5½-inch casing to the total depth, 6,835 feet. At 6,825-30 feet, 4 inches of sand, showing oil and gas, was recovered. Additional cores were cut at 6,830-33 feet and at 6,833-35 feet and although no recovery was made, the section cut like sand.

Interest in the field is now centered on Amerada Petroleum Corp. and Stanolind Oil & Gas Co. No. 1 White, George Ayers Survey, 1 mile east of the discovery, which is drilling in shale below 4,200 feet. Based on the Heterostegina marker, topped at 3,360-80 feet, it is checking approximately 20 feet structurally lower.

Bay City Field

In the Bay City field, Matagorda County, Hamman Exploration Co. was preparing to test No. 1 Cooker which is expected to open a 10,000-foot pay horizon. Although detailed information on the sand record is not available, the hole is bottomed below 10,500 feet and casing has been cemented, preparatory to testing slightly below 9,900 feet. This is apparently the same sand from which 10,000-foot production is developed in the old Ocean field to the southeast in Brazoria County. On the south side of the field, Pan American Production Co. No. 1 Richards is drilling below 9,662 feet in the hope of finding the same sand. Favorable showings have been logged in the 8,100- and 9,100-foot sections.

Merit Oil Co. and others No. 1 Winfree, 800 feet northeast of the Bay City discovery well has been abandoned at 6,670 feet. Discorbis was topped at 5,686 feet, Heterostegina at 5,986 feet and the Marginulina at 6,257 feet. The discovery well which was completed for a small producer through perforated casing at 6,422-28 feet is shut in after "going dead."

Union Producing Co. No. 2 Lutcher Moore Lumber Co., which indicated deep production for the north flank of the old Orange field, Orange County, is bottomed at 6,039 feet with 7-inch casing cemented at 6,024 feet. The hole was scheduled to be carried to 8,000 feet, but because of the favorable showing at 5,965-79 feet, the well is expected to be completed. It is located in the William Dyson Survey in the heart of the old shallow production. On the southwest flank of the field, J. M. Campbell perforated casing in No. 1 Scales at 5,901-17 feet and it tested salt water with no showing of oil or gas. The well is expected to be taken over by the Kirby Petroleum Co.

Albert Plummer No. 1 G. C. Street, D. H. M. Hunter Survey, Pearland area, Brazoria County, is nearing a critical depth and is being watched with much interest. Reports that the well is checking high cannot be confirmed in view of the fact that no less than three Discorbis tops have been reported. Detailed information is being withheld for the time being, although the hole is said to be below 5,200 feet. If this is correct, the outcome should be known early this week.

Failure North of Hardin

In the Hardin field, Liberty County, Jack Frazier's attempt to open production north of the field has apparently failed. His No. 1 Buffam and Benning, J. Robeson Survey, showed 23 thribbles of salt water on a 20-minute drill stem test at 7,350-7,400 feet, and another test was being made at 7,423-51 feet. A Schlumberger survey showed sand at 7,386-95 feet, which recorded 20 ohms resistivity and 40 millivolts porosity and another sand at 7,447-60 feet showed no resistivity and 50 millivolts porosity.

In the Lizze area, Wharton County, Strake Petroleum Corp. and Gulfboard Oil Co. are building derrick for No. 1 W. N. Poole in the H. J. Fry Survey. It is about 3 miles north of Strake's recent dry hole on the O. R. Strunk lease in the L. P. Jennings Survey. Another wildcat location which will attract much attention is George Anderson No. 1 Julia Casey, in the W. D. Smith Survey, Chambers County, several miles northeast of the Cedar Point field in Galveston Bay.

Prospects of a 4,500-foot extension to the newly opened McCrosky field, Matagorda County, were dimmed with the showing of salt water in Pierce Estate No. 1 Kruger. The test was made at 6,698-6,703 feet and showed a small amount of oil and several thribbles of salt water in 10 minutes. It is drilling ahead below 6,900 feet with no further showings reported.

In the same county and at the Citrus Grove Prospect, Sun Oil Co. No. 1 Fred Robbins attracted attention when it attempted to blow out while the hole was being abandoned at a total depth of 10,160 feet. It was brought under control within a short time. The rig is being set up again and a production test will no doubt be made. Sand with a gas odor was logged at intervals from 4,094-9,413 feet, the largest section being at intervals from 8,363 to 9,413 feet.

In the Seabreeze field, Chambers County, Sun Oil Co. was testing No. 1 J. T. White, section 116, H.T.&B. Survey. Gas sand was topped at 8,469 feet, oil sand at 8,474 feet and the hole is bottomed in oil sand at 8,485 feet.

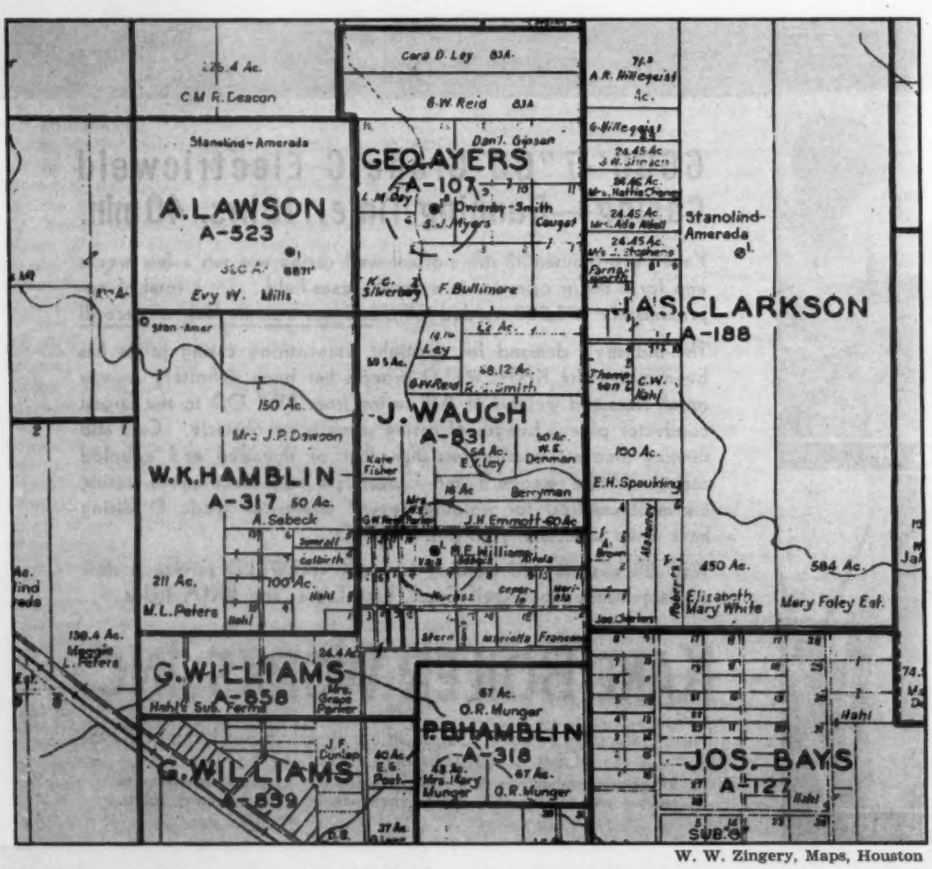
Gulf of Mexico Producer

The first oil flexx in the Gulf of Mexico was opened with the completion of Superior Oil Co. No. 1 State, 1 mile offshore from Cameron Parish, Coastal Louisiana. The completion was made through perforated casing in 70 feet of oil sand at 5,110-80 feet and the well is flowing at the rate of 250 bbls. of 42-gravity oil through a seven-sixty-fourths inch choke with tubing pressure of 550 pounds.

On the Hayes Prospect, southeastern Calcasieu Parish, Shell Petroleum Corp. No. 1 Calcasieu National Bank topped sand at 9,040 feet with an odor of gas and was cored to a total depth of 9,043 feet. As the sand was topped the mud weight dropped from 10.8 pounds to 9.75 pounds which indicates an extremely strong gas pressure. As the hole is bottomed in the top section, future progress of this test will be watched with interest. Location is in section 18-11s-10w.

Recent lease trades on the northwest flank of the Jennings field, Acadia Parish, where Superior Oil Co. opened prolific production indicate an early development program. Noble & Baker acquired a one-acre lease west of Superior Oil Co. test, while Bennet Oil & Gas Co.

(Continued on Page 136)



W. W. Zingery, Maps, Houston

Newly opened Fairbanks field, Harris County, showing locations of outpost tests which have apparently marked up major extensions

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Among Gulf Coast Drilling Contractors

Wynne Crosby is moving in a rig in Wharton County, where a deep wildcat will be drilled for Strake Petroleum Corp. and Gulf Board Oil Co. on the N. Poole lease, in the H. J. Fry Survey, about 3 miles north of the same company's No. 1 Strunk, a recent dry hole. This is the second rig Crosby has operating in that county, as he has started drilling operations on H. C. Cockburn and others No. 1 Hudgins, a wildcat located in the Hungerford area.

Ownby Drilling Co. provided a 3,000-foot east extension to the Fairbanks field, Harris County, and an active drilling campaign is anticipated. The well was drilled jointly with E. L. Smith on the L. M. Meyers lease. No gauge was available, although it has the appearance of making a good producer. The completion of this well, together with the showing of H. E. Williams No. 1 Vega, 1½ miles southeast, makes this structure look very promising, and several new locations are expected to be made at an early date, due to the fact that leases on a number of tracts will expire within the next 60 days.

Jack Frazier's attempt to open a fifth producing area along the Hardin structure, Liberty County, has apparently failed, due to his No. 1 Buffman & Benning showing salt water. It is located in the north part of the field in the James Robeson Survey. In the meantime, his No. 1 Vollmer-Neiman, southeast of distillate production in the Eureka field, Harris County, is making good time, as the hole is below 6,057 feet.

Smith & McDannald cored sand in their No. 1 Gaines, in the Bay City field, Matagorda County, and casing has been cemented for a production test. In the meantime, No. 2 M. Sloan, in the same field, which is being drilled for the Pan American Production Co., is coring below 9,600 feet in the hopes of picking up the newly found 10,000-foot sand, which is being tested by Hamman Exploration No. 1 Crooker, located on the north side of the field.

Frank Bennett recently purchased two rigs which will be used in developing his holding in the Dickinson field, Galveston County. Several locations have been made in the southern part of the field, and actual drilling is expected to be started within the next several days.

Drilling operations in the Hastings field, Brazoria County, which showed a decline shortly after the first of the year, increased during the past two weeks, and 13 active operations are reported in the field. The majority of the work is being done by Stanolind Oil & Gas Co. and Humble Oil & Refining Co. This field has been Texas Gulf Coast's most active area during the past 16 months, and with short extensions still being made in the northern part of the field, it will no doubt continue to maintain its lead for several months. With the exception of Humble Oil & Refining Co., which drills its own wells, all other drilling has been done by Gulf Coast contractors.

Three locations recently announced in Laguna Madre Bay, offsetting production in the Flour Bluff field in Nueces County, are being drilled by Allen & Morris and Al. Buchanan of San Antonio. Active operations were started last week by Buchanan on Humble Oil & Refining Co. No. 1 State, while Sinclair Prairie Oil Co. No. 1 State is being rigged up. Contract for the other test which was also announced by Sinclair Prairie is being started by Allen & Morris. This is the first gulf or bay drilling to be done in the lower Gulf Coast district, although several wildcat locations in other inland bays have been announced and preliminary work on these locations is now under way.

Locations reported for the Texas Coast showed a slight increase the past week as a total of 28 were made. With the exception of two wildcat

(Continued on Page 140)

Taken on the derrick floor of an Al Buchanan rig located in Laguna Madre Bay, lower Gulf Coast, this crew recently started drilling operations on Humble Oil & Refining Co. No. 1 State. E. E. Herring, R. W. H. (Doc) Hudson, driller, Early White, and Ray Eversole

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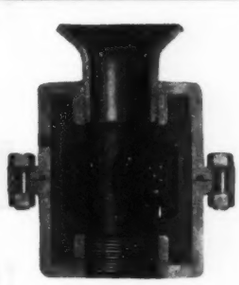

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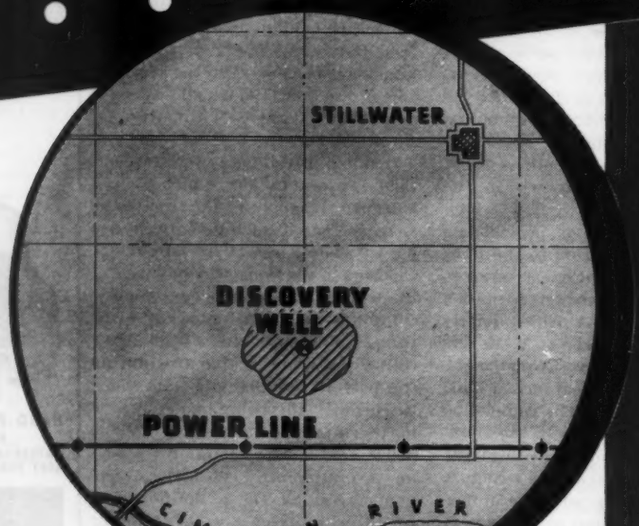

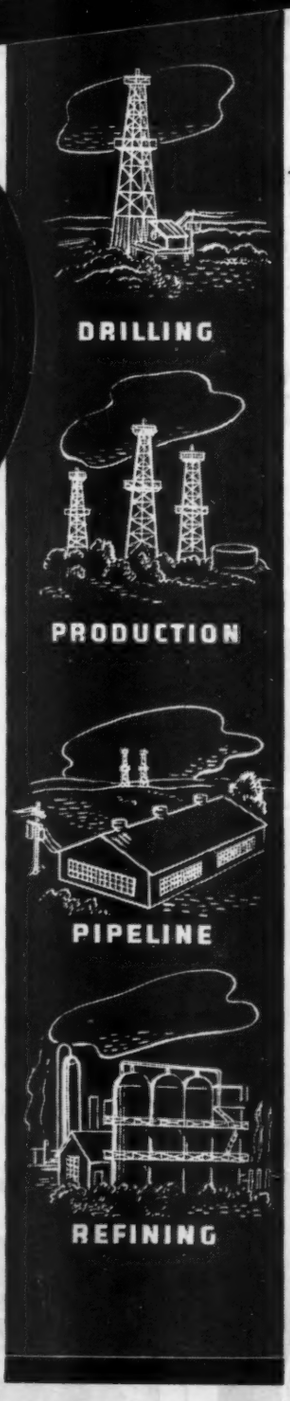

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Oklahoma Operations

By
DAL DALRYMPLE

Formations High in Wildcat Test Southwest of Chandler

Lincoln County stole the show in Oklahoma the past week with two outposts claiming attention, one as a probable pool opener and the other as an extensioner.

Stanolind Oil & Gas Co. and Amerada Petroleum Corp. No. 1 Strader, NW NW NE section 8-13-3e, wildcat southwest of Chandler, was coring ahead after topping Simpson dense at 5,124 feet. Steel line measurements showed top of Viola lime to be 5,092 feet, rather than 5,108 feet as previously reported. It is running higher structurally than other tests drilled in that sector of Lincoln County, but as yet no shows of oil and gas have been reported. The wildcat was being watched closely, as it was given a chance to be a producer because of its high structure and despite failures in other tests drilled in the vicinity. Mid-Continent Petroleum Corp., Sinclair Prairie Oil Co., Shell Petroleum Corp., and Transwestern Oil Co. are interested in the wildcat with the operating companies.

Wilcox Oil & Gas Co. No. 1 Royer, SE SE NE section 18-14-6, gave promise of extending the Sac & Fox pool more than 2 miles westward. It was bottomed at 3,372 feet in Prue sand, bridged after a shot and operators were cleaning out with some oil in the hole. Cores were thoroughly saturated. Several tests were being drilled and new ones started in the Sac & Fox pool. Considerable leasing was reported in this area.

Waukomis Oil Corp. (Hollenbach & Burton) No. 1 Clark, NW cor. section 34-21-6w, discovery well in the Waukomis area of Garfield County, is flowing by heads and produced 322 bbls. of oil in the last 24 hours. Pay was in Marshall sand zone at 7,260-80 feet.

The Hunton lime area of the Fitts field, Pontotoc County, was extended one-fourth mile southeast at Magnolia Petroleum Co. No. 1 Augustanna, SW SW NE section 26-2n-7. It topped Hunton lime at 3,935 feet, total depth 4,070 feet, was acidized, flowed 484 bbls. of oil in four hours and made potential of 2,736 bbls. This test was started as a salt water disposal well. The company was starting work at No. 2 Augustanna, NE SW NE section 26-2-7.

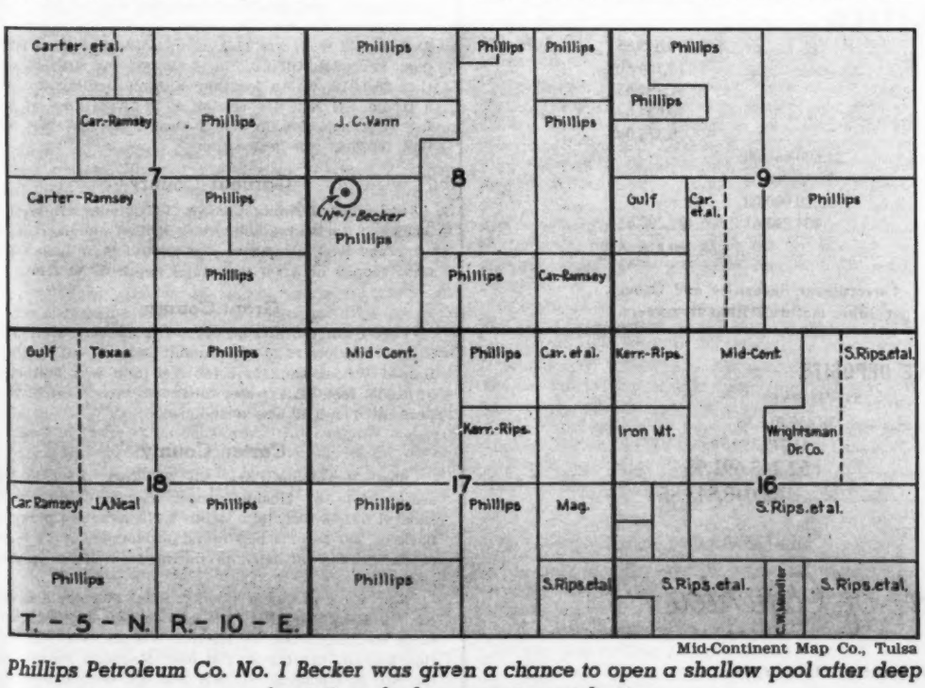
W. L. Kistler, Inc., No. 1 Hedlund, SW NE NE section 11-5-9w, on the east side of the Cement field, Caddo County, gauged 141,933,000 feet of gas from pay at 4,976-5,022 feet, and was shut in. Other wells were near completion in both the east and west sectors of the field.

Phillips Petroleum Co. No. 1 Beeker, NE NW SW section 8-5-10, wildcat in the Calvin area, southern Hughes County, was bailing mud and a small amount of oil as operators sought source of water that rose high in the hole after drilling plug set at 5,780 feet in first Wilcox sand. The well was plugged back from original total depth of 6,286 feet in hard, dry sand. It showed as a small producer in upper formations.

Gulf Oil Corp. No. 1 Thomas, SW NW NW section 14-4n-5w, wildcat in Grady County and the deepest test in Oklahoma, was drilling below 11,125 feet in shale, with a possibility that it may be drilled to 15,000 feet to obtain data on deep formations in the Anadarko Basin.

New activity was reported in far western Oklahoma. Bowen Drilling Co. No. 1 Webber, NW SE NE section 1-20-23w, about 8 miles north of Arnett in Ellis County, was announced as location for a deep test on a large block of leases. In Kiowa County, Anderson-Prichard Oil Corp. No. 1 Hancock, SE SE NW section 23-6-14w, was moving in material. It is on the company's 4,000-acre block southeast of the Gotebo district. Simpson formation is expected around 800 to 1,200 feet. The company plans three other tests elsewhere in the county.

The first of three Indian lease sales scheduled for early dates will be held at the Kiowa agency in Anadarko March 24, when 186 tracts totaling 22,307.31 acres will be offered the highest bidders. The tracts are in Tillman, Caddo, Kiowa, Comanche and Grady counties. The next Osage Indian lease sale will be held at the agency in Pawhuska March 29, when 94 tracts comprising 14,786.87 acres will be offered. The third sale to be announced will be held at the Five Civilized Tribes agency in Muskogee April 4 when 85 tracts in eastern and southern counties will be offered.



Mid-Continent Map Co., Tulsa

Phillips Petroleum Co. No. 1 Becker was given a chance to open a shallow pool after deep formations had proven nonproductive

Estimated Daily Production

Estimated daily production of Oklahoma for the week ending March 12, and for the preceding week, was as follows:

	Barrels	
	Mar. 12	Mar. 5
Allen	5,625	5,500
Billings	8,100	7,925
Burbank	7,550	7,450
South Burbank	13,350	12,900
Balance Osage	18,750	18,500
Blackwell district	5,500	5,450
Bristow-Slick	6,500	7,000
Chandler	2,375	2,350
Crescent	7,450	6,800
Cromwell	3,125	3,050
Cushing-Shamrock	10,300	10,250
Duncan district	3,650	3,675
Edmond	6,800	7,500
Fish	4,050	3,900
Fitts	59,100	62,475
Jesse	4,100	4,200
Graham	5,450	5,500
Gray	1,000	1,125
Healdton	9,375	9,250
Hewitt	3,950	3,975
Keokuk	5,800	5,700
Konawa	1,475	1,325
Lucien	13,000	12,150
Moore	7,125	7,200
Oklahoma City	129,150	124,075
Olympic	6,950	6,900
Ramsey	825	
Sasakwa	1,775	1,625
Sholem-Alechem	2,900	2,900
Seminole district:		
Bowlegs	9,950	9,475
Carr City	3,925	4,300
Dora	5,650	
Earlsboro	5,700	5,525
South Earlsboro	575	525
East Earlsboro	5,575	5,675
Little River	8,600	8,800
East Little River	925	850
Maud	800	625
Mission	1,775	1,800
Seminole	8,450	8,000
East Seminole	1,775	1,800
Searight	3,625	3,525
Total Seminole	57,325	50,900
St. Louis-Pearson	17,975	17,500
Tatums	6,300	6,250
Tonkawa-Garber-Thomas	4,250	4,200
Wewoka	2,400	2,350
Yale-Jennings	3,725	3,700
Other pools	79,000	86,925
Total Oklahoma	526,075	522,475

Wildcat Completions

Helmerich & Payne No. 1 Ritchie, C NE NW section 34-18-1e, wildcat southwest of the Ramsey pool in Payne County, had first Wilcox sand at 5,246-85 feet, second Wilcox sand 5,340 feet, and was dry and abandoned at 5,353 feet, total depth. It topped Mississippi lime at 4,860 feet, Chattanooga shale 4,995 feet, Misener sand 5,043 feet, Sylvan shale 5,115 feet, Viola lime 5,175 feet, Dense 5,210 feet, Dolomite 5,220 feet.

Arrow Drilling Co. No. 1 Dobson, NW cor. section 23-17-1w, Logan County outpost, was dry and abandoned when salt water intruded at 5,385 feet, total depth. Viola lime was topped at 5,138 feet, Dense 5,185 feet, Dolomite 5,200 feet, first Wilcox sand 5,227 feet, second sand 5,368 feet.

Stanolind Oil & Gas Co. and Amerada Petroleum Corp. No. 1 Blunt B, outpost in the Seward area, Logan County, had first Wilcox sand at 6,345-90 feet, second Wilcox sand 6,445 feet, total depth 6,495 feet, plugged back to 5,930 feet, perforated casing, had a small showing of gas and was abandoned.

Carter Oil Co. and Norbla Oil Co. No. 1 Osage, NW cor. section 3-24-6, wildcat in Osage County, found Bartlesville sand at 2,739-58 feet lightly stained but had a hole full of water at 2,839 feet, total depth, and was abandoned.

F. B. Schoonover and others No. 1 Loftis, NW NW SE section 19-2s-18w, Tillman County wildcat, was an abandoned location.

Harper-Turner No. 1 Pollock, NW NW section 13-

9-2w, wildcat in Cleveland County, was dry and abandoned at 7,590 feet. Second Wilcox sand was topped at 7,550 feet.

Jim Turner and others No. 1-A Collins, SW NE NE section 18-4s-10w, Cotton County wildcat, had sand showing oil and water at 1,229-46 feet, but was dry and abandoned at 1,305 feet. It was designated as a 1,300-foot test.

H. L. Grimes and others No. 1 Laney, NW cor. section 3-3s-18w, wildcat in Tillman County, had nothing showing and was dry and abandoned at 4,020 feet, total depth.

Seminole County

Francis Oil & Gas Co. No. 2 Harris, NE NW NW section 4-6-6, Dora pool, Seminole County, found Boggy sand at 2,798 feet, total depth 2,870 feet, plugged back to 2,860 feet and shot. It flowed 250 bbls. of oil through casing in the first 24 hours.

Wood Oil Co. No. 1 Maxey, NW SW NW section 1-8-6, had Wilcox sand at 4,146 feet, total depth 4,164 feet, was shot and pumped 220 bbls. of 39-gravity oil in 24 hours.

W. C. McBride, Inc., No. 1 Harbert, NW SE SW section 20-6-7, had Boggy sand at 2,709 feet, total depth 2,740 feet, plugged back to 2,738½ feet, pumped 14 bbls. of oil and 1 bbl. of water in 24 hours and was completed.

Myers & Holko No. 1 Berrio, SE SE NW section 15-10-6, was dry and abandoned at 2,116 feet, total depth.

New work in Seminole County: Sinclair Prairie Oil Co. No. 3 Rossanna, SW NW SW section 28-10-8, location; Simpson & Roodhouse No. 1 Jackson, C SW NE section 15-6-6, rigging up rotary; Atlantic Refining Co. No. 3 Damron, SE NE NW section 22-6-6, building rig; J. F. Smith No. 3 Harryman A, SE SW SW section 32-7-6, rigging up rotary.

Pontotoc County

Magnolia Petroleum Co. No. 1 Swift, NE SE SE section 3-1n-7, only completion of the week in Pontotoc County, topped McLish formation at 4,815 feet and was dry and abandoned at 5,004 feet, total depth. It was in the Jesse district.

First reports of new work in Pontotoc County: A. Michaelson No. 1 Lord, NW cor. section 3-1n-7, location; H. L. Blackstock No. 3-A Craddock, NW NE SE section 25-2n-6, location; Ross Oil Co. No. 1 Bray, SW SE NW section 25-5-4, location; Dickson Oil Corp. No. 4 Jackson, NE SW SW section 22-5-6, drilling at 950 feet.

Oklahoma County

Hall & Briscoe No. 1 Miller, NE SE NE section 36-12-3w, Oklahoma City field, Oklahoma County, had Johnson sand series at 6,350 feet, was bottomed at 6,408 feet, and averaged 360 bbls. of oil daily on gas-lift, flowing through tubing.

Coal County

Choctaw Oil & Gas Co. No. 1 Myers, C W half SW SE section 6-1n-8, Coal County sector of the Jesse area, an old well, was plugged back from 4,332 feet to 2,614 feet, acidized and flowed 38 bbls. of oil in four hours after knocking out plug. It was a recompletion.

Pottawatomie County

Indian States Oil Co. No. 1 Hickey, SE SE NW section 32-11-4, Pottawatomie County, had Sylvan shale at 5,271 feet and was dry and abandoned at 5,274 feet, total depth.

New work in Pottawatomie County: McLenan No. 1 Fidler, NE NE NW section 9-5-5, wildcat, moving in material; Denver Producing & Refining Co. and others No. 1-A Boeller, C E half NW SE section 5-6-5, waiting on cement; Myers No. 1-A Owens, NE SE SE section 21-7-4, drilling at 1,308 feet; Denver Producing & Refining Co. No. 1-A Davidson, C W half W half NE section 22-7-4, cellar and pits; Vivian Oil Co. No. 2 LeClair, NE NW NE section 23-7-4, cellar and pits.

Osage County

Tide Water Associated Oil Co. No. 3 Osage, SW NW SW section 21-24-9, Osage County, found Bartlesville sand at 2,223 feet, total depth 2,270 feet, was shot and completed as a 100-bbl. pumper.

Ray Branstetter No. 4 Osage, NE SE SW section 23-22-11, topped Bartlesville sand at 1,588 feet, total depth 1,633 feet, was shot and pumped 4 bbls. of oil and 4 bbls. of water daily.

Fred Hight No. 9 Osage, SE NW NW section 3-22-9, was completed as a 2-bbl. pumper in Layton sand at 1,015-40 feet, total depth.

Barnsdall Oil Co. No. 21 Osage, SE NW SE section 5-20-12, an old well, was deepened from 1,436 feet to Burgess sand at 1,597-1,605 feet, total depth, and pumped 10 bbls. of oil and 2 bbls. of water daily.

Harland Oil Co. No. 33 Osage, CSL NW NW section 25-24-11, an old well, was deepened from 1,720 feet to 1,742 feet, and pumped 6 bbls. of oil daily.

Indian Territory Illuminating Oil Co. No. 187 Osage, NW SE SW section 31-25-10, an old well, was deepened from 1,641 feet to Arbuckle lime at 2,364-65 feet, total depth, and produced 7,500,000 feet of gas.

Pure Oil Co. No. 106 Osage, SE NE SW section 9-23-8, an old well, was rigging up to deepen from 2,272 feet; Barnsdall Oil Co. No. 3 Osage, NW SW SE section 23-24-10, was a location; Sidwell Drilling Co. No. 6 Osage, SE NW SW section 27-24-11, drilling at 685 feet; Coralena Oil Co. No. 1 Osage, NE SW NE section 36-26-8, was a location.

Garfield County

Champlin Refining Co. No. 1-C Kindt, NE section 36-23-4w, Garfield County, was drilled and completed as a gas well, producing 7,000,000 feet of gas from Chat topped at 5,096 feet, total depth 5,150 feet.

Grant County

Carter Oil Co. and others No. 1 Barclay, C E half SE NE section 17-25-3w, Lamont area, Grant County, topped Wilcox sand at 5,442 feet, and was bottomed at 5,555 feet. Salt water intruded after casing was perforated and it was abandoned.

Carter County

Shell Petroleum Corp. No. 21 Keck, NE SE NE section 5-4s-3w, Healdton pool, Carter County, had sand at 532-48 feet, total depth 1,170 feet, and plugged back to 550 feet. It had initial production of 17 bbls. of 33.8-gravity oil daily, producing from Deese formation.

New work in Carter County: Shell Petroleum Corp. No. 22 Keck, NE NW NE section 5-4s-3w, location; same company's No. 18 Harton, NW SE SW NE section 6-4s-3w, drilling at 220 feet; Magnolia Petroleum Co. No. 78 Richards, SE NW SW NE section 6-4s-3w,

(Continued on Page 138)

NATIONAL BANK OF TULSA

Tulsa, Oklahoma

Statement of Condition, March 7, 1938

RESOURCES

Cash and Due from Banks	$30,136,717.28	
U. S. Government Securities	13,732,480.09*	
Other Bonds and Warrants	4,931,193.83*	
		$48,800,391.20
Loans and Discounts		16,553,795.41
Overdrafts		5,667.94
Income Receivable Accrued		149,901.03
Stock in Federal Reserve Bank		180,000.00
Investment in Bank Premises		2,877,898.37
Customers' Liability under Acceptances		12,764.50
TOTAL		$68,580,418.45

LIABILITIES

Deposits		$62,048,843.85
Acceptances Executed		12,764.50
Income Collected not Earned		57,797.65
Interest, Taxes, etc., Accrued		48,434.84
Reserve for Preferred Dividends		8,375.00
Capital—Preferred	$1,500,000.00	
Capital—Common	2,250,000.00	
Surplus	2,250,000.00	
Undivided Profits and Reserves	404,202.61	6,404,202.61
TOTAL		$68,580,418.45

* Of the total of $18,663,673.92 U. S. Government Securities and Other Bonds and Warrants $13,103,318.71 par value mature within five years.

COMPARATIVE DEPOSITS

March 7, 1934	$33,758,518.69
March 7, 1935	38,457,011.38
March 7, 1936	47,749,399.50
March 7, 1937	52,243,691.95
March 7, 1938	62,048,843.85

The Oil Bank of America

Member Federal Deposit Insurance Corporation

Central West

By STAFF CORRESPONDENT

Twenty Operations Start in New Centralia Field, Illinois

MATTOON, Ill., Mar. 14.—The new Centralia field, west of that city and in Clinton County, continued to almost monopolize the interest in the Illinois Central Basin fields in the past week as 20 new operations were reported, most of them on town-site lots in real estate extensions to Centralia. Three wells were completed in the pool during the week, but nine wells were in the Benoist sand pay, not yet completed. They should be ready for completion report next week.

New Operations

The new operations during the week vastly outnumbered the completions. Thirty-six new starts were reported in the various stages of locations, derricks up or wells drilling, while only nine wells were completed. There were some wildcat disappointments among the completions.

In Bond County, W. C. McBride, Inc., No. 1 Butler. SW cor. SE section 30-4n-2w, was dry and abandoned at 1,380 feet. St. Louis lime (Upper Mississippian) was topped at 1,353 feet.

In Clinton County, Holle & Willis No. 1 Hughes estate, C N half NE NW section 18-3n-2w, a wildcat, was dry and abandoned at 1,454 feet. St. Louis lime top was at 1,408 feet, and there was a showing of gas at 1,420-23 feet. Ohio Oil Co. No. 4 Trame estate, SE cor. NE NE NW section 8-1n-3w, had sand at 992-95 feet, which was shot with 20 quarts. It produced only salt water and was abandoned. John Pugh No. 1 Copple, NW cor. SW NE NE section 13-1n-1w, shot in sand at 1,357-75 feet, was put on the pump and made 280 bbls. of oil in 24 hours and was completed. Shell Petroleum Corp. No. 1 Buehler, near NE cor. NW NW section 12-1n-1w, pumped 99 bbls. initially from Benoist sand at 1,349-80 feet. Connery and others No. 1 Feltman, 945 feet from south and 625 feet from east lines, SW quarter section 12-1n-1w (corrected location), is a 220-bbl. pumper at 1,366-76 feet. The three last mentioned wells are in the Centralia field.

Stanolind Oil & Gas Co. deep test in Jackson County, No. 1 Leiner, NE NW SW section 20-7s-4w, was dry and abandoned at 4,133 feet having penetrated St. Peter sand topped at 4,093 feet, which had a sulfur odor and water.

In Fayette County, Carter Oil Co. No. 1 Dove, C E half NW SE section 15-8n-3e, was completed after it had pumped 177 bbls. of oil in 24 hours from Benoist sand at 1,480-90 feet.

In Richland County, Tom McGinley (formerly reported as Ypsilanti Oil Co.) No. 1 Tolliver, C NE section 17-3n-9e, pumped 110 bbls. in 24 hours from pay at 2,945-68 feet and was completed. Pure Oil Co. No. 3 Montgomery B, C S half NW NW section 4-3n-9e, had pay at 2,929-47 feet, and saturated dolomite at 2,987-95 feet, and flowed 1,770 bbls. in 24 hours and was completed.

Nineteen wells in the pay were being made ready for completion in Clinton, Richland and Clay counties, while in Fayette County, John Farrelly, in his No. 1 Lilly, SE cor. SW SE section 11-8n-3e, which pumped and flowed 30 bbls. a day from pay at 1,498-1,522 feet, will be drilled deeper to test the Benoist pay. Brookside Oil & Gas Co. No. 1 Dodillet, SE SW NE section 21-1n-1w, Clinton County, an outpost, got salt water at 1,416-20 feet and was shut down for orders.

Thirty-six first reports of locations, rigs or wells drilling were garnered in the roundup of new operations in the basin in the past week. About a score of these were in the new Centralia pool in Township 1n-1w, Clinton County, on the western outskirts of the city of Centralia, which is just over the line in Marion County. These include: Shell Petroleum Corp. No. 2 Buehler, C SW SE SW section 1-1n-1w, rigging up rotary; Shell No. 2 Pitchford, SW NE SW section 1-1n-1w, derrick; Carter Oil Co. No. 1 Buehler, 990 feet from north and 1,034 feet from east lines, SW quarter section 12-1n-1w, rigging up; H. H. Weinert, Inc., No. 1, SW NE NE section 13-1n-1w, rigging up; Selegna Petroleum Corp. No. 1 Meisenheimer, SW cor. NW NE SE section 13-1n-1w, set pipe on top of Benoist sand at 1,352-72 feet; A. B. Ryan No. 1 Kent, near NE cor. SE SE NE section 13-1n-1w, moving in material; John Pugh Drilling Co. No. 1 Pfoff, NW cor. NE NE SE section 13-1n-1w, derrick; same operator's No. 1 Pfeiffer, NE cor. NW NE SE section 13-1n-1w, in Benoist sand at 1,356-82 feet, with casing set at 1,355 feet; Nash, Redwine and others No. 1 Wilson, NW cor. SW SE NE section 13-1n-1w, derrick; Muhlbach & Pray No. 1 Schuman & Beckmyer, near NE cor. section 13-1n-1w, derrick; B. M. Hastings No. 1 Battison and Gambrill, NE cor. SW SE NE section 13-1n-1w, in Benoist sand at 1,355-75 feet, with pipe set at 1,347½ feet; H. & H. Drilling Co. No. 1 Remacle, SE cor. SW NE NE section 13-1n-1w, derrick; H. & H. Drilling Co. No. 1 Brenneman, NW NE SE NE section 13-1n-1w, rigging up rotary; T. T. Eason and others No. 1 Sailor, NE cor. SW SE NE section 13-1n-1w, drilling at 1,050 feet; Clint Crosby and others No. 1 Skipper & Koeling, SE cor. NW SE NE section 13-1n-1w, derrick; Bailey and others No. 1 Veitman, NW cor. SW SE NE section 13-1n-1w, rigging up; Adams Oil & Gas Co. No. 3 Hefter heirs, SE cor. SW NE section 13-1n-1w, rigging up; Adams No. 2 Hefter heirs, NE cor. SW NE section 13-1n-1w, drilling at 1,152 feet. Charles E. Stewart No. 1 Schitzman, SW NW SW section 6-1n-1w, a wildcat, shut down at 120 feet.

In Fayette County, W. V. Greer has derrick up for No. 1 Metzger, C N half NE NW section 19-5n-2e.

In Marion County, W. D. Shelden and others spudded No. 1 Pawlica, SW NE SW section 33-2n-1e, and Marion Oil Co. is awaiting the arrival of a machine to start No. 1 Wilson, NE NE SE section 18-3n-1e.

In Richland County, Kingwood Oil Co. and others have derrick up for No. 1 Elliott, C N half SE NE section 28-4n-10e.

In Effingham County, Kingwood Oil Co. and others were having hole trouble in No. 1 McWhorter, C E half SE NW section 15-6n-6e, total depth 2,001 feet, and may skid the rig and start a new hole.

In Macon County, Warren Brothers No. 1 Peterson, NW NW SW section 3-15-2e, was shut down for repairs at 600 feet.

In Marion County, Muhlbach & Pray No. 1 Fox, NW cor. section 18-1n-1e, was rigging up. Penn Oil Co. No. 1 Jarvis, 220 feet from west and 1,730 feet from south line, SW quarter section 5-1n-1e, was rigging up. Tate & Longoria No. 1 Skipper, SW cor. SE section 6-1n-1e, drilling at 500 feet; Charles E. Stuart No. 1 Kuester, NW SW SW section 5-1n-1e, was at 320 feet, waiting for casing.

In Jefferson County, Carter Oil Co. made a location for No. 1 Inez Cobb, C W half NW SW section 10-1s-2e.

In Richland County, Mammoth Producing & Refining Co. had derrick up for No. 2 Bell, NW NW NE section 28-3n-9e. Pure Oil Co. made a location for No. 3 Hundley, C E half SW NE section 21-3n-9e. Pure Oil Co. No. 1 Wheeler, 1,823 feet from north and 330 feet from east lines of NW quarter section 17-3n-9e, was a location, as were Pure Oil Co. No. 1 Allard, NW cor. NE SE section 17-3n-9e, and No. 10 Palmer Taylor, C W half NW SE section 15-3n-9e, while cellar and pits are dug for Pure No. 5 C. T. Montgomery-B, C N half NW NW section 4-3n-9e.

Among the Wildcats

In Pope County, C. C. Whitlock No. 1 Anthis, NE NW NE section 12-11s-5e, was at 1,450 feet, awaiting a cable.

In Edwards County, Leach Brothers No. 1 Lee, SW NE SE, was drilling at 3,108 feet.

In Saline County, Will Rogers and others No. 1 Baylor, SE SE SE section 3-10s-6e, set 6⅝-inch casing at 1,183 feet, total depth 1,280 feet, and the crew was cleaning out. C. F. Bolton and others were shut down and building fuel tanks at No. 1 Beagle, NW cor. NE section 13-9s-3e.

In Franklin County, Washburn Petroleum Co. No. 1 Neal, C E half SE SE section 6-5s-4e, topped Glen Dean at 2,486 feet, set 6-inch casing at 2,595 feet and was drilling below 2,600 feet.

In Jefferson County, Nollem & Benoist No. 1 Kelly, NE NW NE section 25-4s-2e, set 6-inch casing at 2,610 feet and was drilling at 2,645 feet. Dee & Foltz No. 2 Hamilton, SW SW NW section 20-4s-3e, was shut down at 1,150 feet, awaiting fuel. H. J. Foltz (formerly reported Dee and others) No. 1 Carroll, NE NE SE section 16-2s-1e, was drilling at 1,220 feet.

In Bond County, Whitehead & Morey No. 1 Polland, NW SE SW section 26-6n-2w, was drilling at 2,777 feet.

In Randolph County, Mabee Consolidated Corp. No. 1 Wilson, NE SE NE section 3-4s-5w, was drilling at 2,590 feet.

In Washington County, Betterman and others No. 1 Jesse, C SE NE section 16-3s-2w, had sandy lime at 1,042-50 feet, with a small showing of oil, and 6-inch casing was being run.

In Edgar County, Sun Oil Co. was moving in material to start No. 1 Goodwin, C W half NE SE section 22-13n-12w (measuring from the Indiana principal meridian).

OHIO

LIMA, Ohio, Mar. 14.—A 118-bbl. well in Clinton sand in Licking County and the 40-bbl. initial production from an interesting test in Seneca County were outstanding features of field developments in Ohio in the past week. The Seneca County well which is a joint test of the Sun Oil Co. and the Tiffin Oil Co., produces from the Green sand and the oil is of a higher gravity, and with less sulfur content, than that found in the Trenton limestone.

In Ashland County, Hanover Township, Ohio Fuel Gas Co. No. 1 R. L. Parrott, section 23, made 524,000 feet of gas from the Clinton sand at 2,926 feet.

In Ashtabula County, Monroe Township, Maumee Gas & Utilities Co. No. 1 George H. Smith, Lot 1, is good for 150,000 feet of gas from the Austinburg sand at 2,058-63 feet. In Saybrook Township, Gladding and others No. 1 F. E. Piper, Lot 46, made 35,000 feet of gas from the Oriskany sand at 1,695-97 feet.

In Athens County, Ames Township, D. T. Orndoff No. 1 Mary Harrison, section 7, had 500,000 feet of gas from the Stray sand at 695 feet. In York Township, Kachelmacher Oil & Gas Co. No. 1 H. H. Jackson, section 10, made 280,000 feet of gas from the Berea at 925 feet.

In Guernsey County, Center Township, Hayes Ferguson No 1 Mary Anderson, section 13, found the Berea dry at 1,300-51 feet and it was abandoned

In Licking County, Fallsbury Township, Emerald Petroleum Co. No. 4 I. M. Cochran, section 12, made 118 bbls. of oil the first 24 hours after a shot from the Clinton sand at 2,972-3,019 feet. In Mary Ann Township, Rutlege and others No. 3 Mary H. Scott, Lot 19, first quarter, produced 75,000 feet of gas per day from the Berea at 754 feet.

In Meigs County, Sutton Township, Proffitt and others No. 1 Katie Theiss, section 17, found the second Cow Run dry at 570-90 feet and abandoned the test.

In Monroe County, Benton Township, Hill Oil Co. No. 3 A. T. McCaslin, section 30, was drilled to 1,625 feet and abandoned.

In Perry County, Reading Township, Gas Producing

(Continued on Page 138)

Michigan Field Report

By
O. C. PRESSPRICH

Bad Roads Only Deterrent to Increased Drilling Operations

SAGINAW, Mich., Mar. 14.—Like the proverbial calm before a storm, spring's approach is reflected in Michigan oil fields this week by stimulated preparations for oil and gas exploration, though production activity fell to the low point of the year. Completions entering production in all fields were fewer than for any week in more than a year, while drilling permits numbered 27, a new 1938 high.

Widespread exploration in Allegan County was forecast in the permit issue, while the Edenville area came in for further attention. Six permits in four townships of Allegan County; seven in Gladwin County, equally divided between Buckeye and Bentley Townships; three tests in Midland County's Edenville field, and five permits for gas tests in the immediate vicinity of Gulf Refining Co.'s sensational 14,000,000-foot gasser in Grant Township of Clare County, indicated further exploration trends.

Direct offsets to the Edenville discovery well appear in the permit lists, awaiting only the arrival of favorable highway conditions to permit moving of equipment over roads, before the flurry is underway. Indications were bright in several fields that the current week would see a big step-up in production as a number of wells were in the Dundee limestone, especially in the Buckeye area, and ready to enter production within a few days.

Another important development of the week was the withdrawal of Shell Petroleum Corp. from active production efforts in Michigan oil fields after more than 10 years activity. Through an arrangement with Pure Oil Co., the Shell corporation turned over approximately 100,000 acres of oil leases to Pure, which will explore leases on a 50-50 basis. About 500 acres involved in the transaction lies in the Edenville area, with some of this property due to be drilled soon.

Allegan County continues to attract attenton, due to the recent strike in Monterey Township (3n-13w) of Sim B. Hood Trust's No. 1 Wright, which continued to produce naturally at the rate of better than 200 bbls. daily following suspension of activities because of lack of storage space and a fire which destroyed equipment. Considerable activity was apparent in Monterey Township due to the strike, with several tests progressing on the strength of a possible new pool. Dorr Township, to the southeast of the Salem-Allegan pool, appeared another find this past week as Eureka Development Co.'s test in section 29 logged a favorable show at its No. 1 Widenfeller wildcat, about 8 miles southeast of the Salem field.

Gladwin County

Along with other Michigan petroleum production of the week, Buckeye lagged to record only four new producers, only one of which was a natural. This was Kales-Graves Co. No. 2 Wooding, NE SE SE section 23-18n-1w, a 100-bbl. daily producer. The test adds another oil well to section 23, the discovery sector of the so-called midway pool, now definitely a part of the south (Oard) pool.

One of the most significant tests of the week in the north Buckeye pool was Sun Oil Co. No. 4 Strohkirch, SE NE NE section 9-18n-1w, a western boundary extension, which logged 500 bbls. in 24 hours after acid treatment. The test is 13 locations west and seven north of the discovery well in the area, and promises large scale development in the northwest sector of the pool. Another Sun test in the northeast sector, with several dry holes in the immediate vicinity, developed into a small pumper. It was Sun's No. 1 Hipfel, SE SW SW section 2-18n-1w, a 75-bbl. daily pumper after acid. Robert L. Tope No. 5 Ludwig-Buehler, NE SW NE section 26-18n-1w, in the south (Oard) pool, shot up its initial gauge to 225 bbls. after acid. Hanners Development Co. No. 2 State, NE SE NW section 35-18n-1w, was acid testing, and due for completion this week.

With a heavy play the previous week adding four favorable producers to the Bentley field, Gladwin County, activity eased up the past week, although a half-dozen wells were expected to enter production any day. Turner Petroleum Corp. No. 1-E State, NW NE NE section 29-17n-2e, was acid-treating after a good show of oil, and Bentley Oil Co. No. 4-A State, SW SE NE section 20-17n-2e, was swabbing in preparation for acid. These two tests lead others as prospective producers.

Midland County

More than a dozen tests were under way in central Michigan's latest prospective oil pool, Edenville, Midland County, as Chapman Oil Co.'s discovery continues to produce under rigid restriction due to road conditions. There were no further developments in the area other than the activity apparent as operators made ready for extensive probing of the area.

Leading was Mammoth Producing & Refining Co. No. 1-A Ricket, NE SE NW section 27-16n-7w, a west offset to Chapman's discovery. The test was reported below 1,500 feet, and barring accidents was scheduled as the first of the Edenville tests to confirm—or refute—Chapman's discovery.

Sun Oil Co., which has several tests under way in the Edenville area, inaugurated the innovation this week of naming its wells after the township. Henceforth all Sun tests located on state lands in Edenville will be "Edenville" wells.

Nearly 2 miles to the south of the Chapman discovery, Sun Oil Co. is below 1,000 feet on its No. 1-A Jerome, N half NW NW section 3-15n-1w. Sun still is testing its No. 1-A Edenville, C N half SE NE section 5, more than 4 miles northwest of the producing Chapman. Hopes of commercial production are reported encouraging.

Isabella County

Central Michigan's oil fields near Mount Pleasant, Sherman Township, Isabella County, likewise felt the production calm the past week, with only one producer added to the field. It was Pure Oil Co. No. 4 Baker, NE SE NW section 33-15n-6w, a 600-bbl. producer after acid.

In Broomfield Township, J. V. Wicklund Development Co. No. 3 Skarritt, NE NE SE section 5-14n-6w, reported by uninformed sources last week as a prolific producer, was cutting a large percentage of water this week, with approximately 25 bbls. of oil daily.

Testing of the Dundee at J. Golden Zabel No. 1 Kennedy Estate, NW NW NE section 25-14n-4w, Union Township, Isabella County, was scheduled this week. The test had passed the 3,550-foot marker. According to geological information, the Dundee limestone is expected to be tapped at about 3,670 feet, although some expect it at about 3,700 feet. Favorable possibilities are reports at the site as structures apparently are running higher than in Gulf Refining company's test in section 1 of Lincoln Township, approximately 2 miles south of the Kennedy well.

In an attempt to conform the oil production possibilities of Nottawa Township, Isabella County, tapped last fall by Boston Oil & Gas Co. No. 1 Fox in section 23, Wicklund Development Co. No. 4 Lawens, NW SW SE section 24-15n-5w, was drilling below the 2,100-foot mark this week. The Boston-Fox test did not rate commercial production. The Wicklund test is about 1 mile to the southwest of the Nottawa oil show last fall.

Arenac County

Two producers were added to the Clayton field in Arenac County. Rose & Bernier, Inc., No. 1 Buhl, NE NE NE section 8-20n-4e, developed 125 bbls. daily after acid, and W. J. Sovereign No. 1 Peavey, NE SE NE section 8-20n-4e, was pumping 15 bbls. daily after acid treatment.

Montcalm County

Undaunted by a Dundee failure, Socony-Vacuum Oil Co. No. 1 Hansen, C N half NE NE section 22-12n-6w, Montcalm County, was plugging back this week to the level at which a 5,000,000-foot gas flow was discovered as the test went through the Michigan Stray sand. The test was intended as an oil exploration, but the Dundee was found dry. Hopes were entertained that the gas production encountered could be increased when the well is plugged back.

Smith Petroleum Co. No. 1 Williams, SW SW SE section 17-11n-7w, Montcalm County, was plugged and abandoned last week after finding the Dundee dry.

Ogemaw County

A favorable extension test came into production last week at Dunnigan & Fothergill No. 1-A Allen, NW NW SE section 20-22n-2e, West Branch field, Ogemaw County, a 100-bbl. producer after acid. The test is on an exterior location and indicates possible exploration of nearby locations.

Saginaw County

Failure rewarded the attempt of Hogan, Inc., to strike a producer in Lakefield Township, Saginaw County, when its No. 1 Bennett, SW NW NW section 2-11n-1e, was found dry in the Dundee.

Production Increase Expected

Michigan crude production, averaging nearly 1,500,000 bbls. a month for the past year, gives promise, with expanding fields and discovery of several new ones in the past few months, of pushing near a 2,000-bbl.-a-month average before the end of 1938.

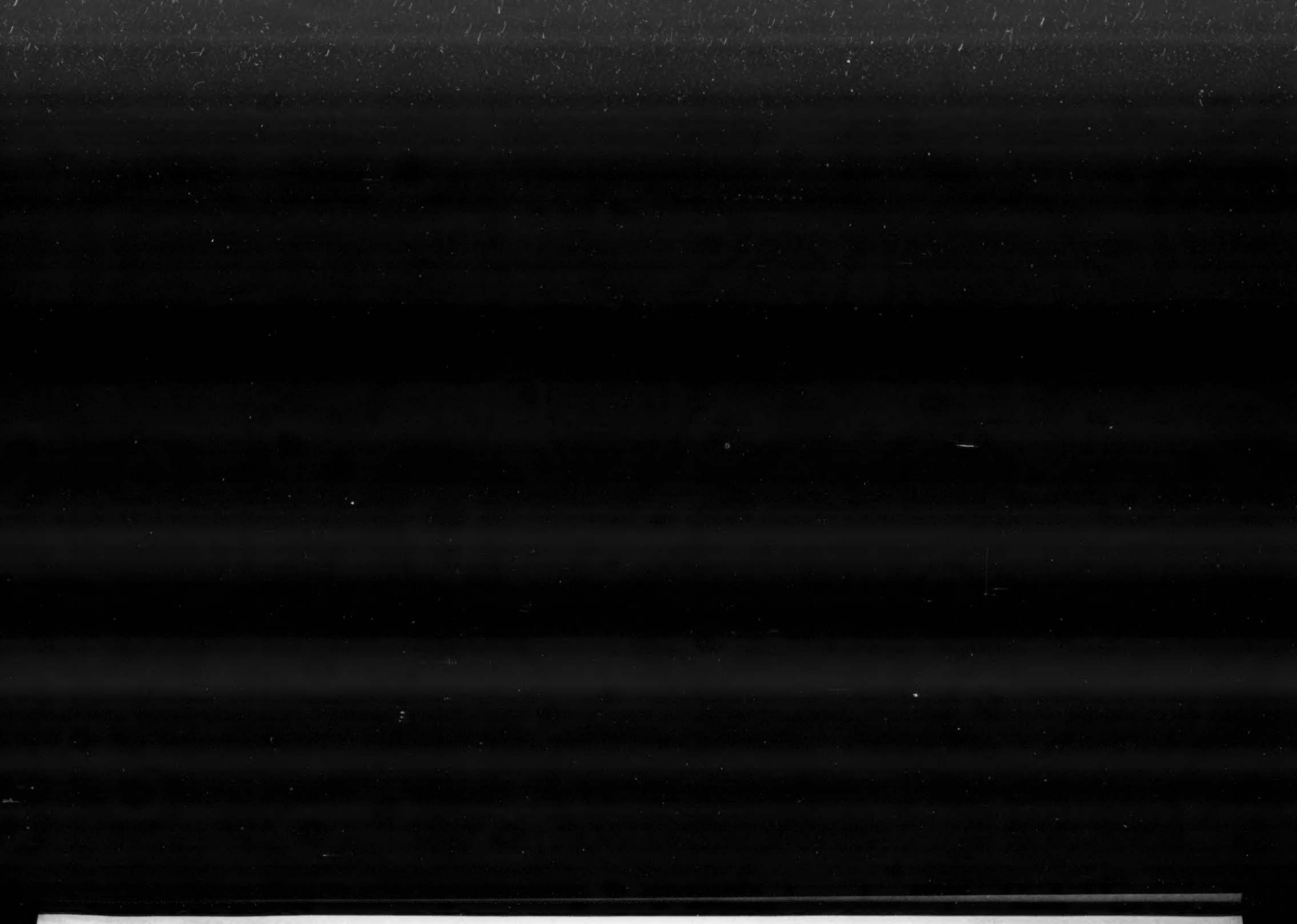
February production figures just released by Oil & Gas Association of Michigan total 1,497,256 bbls. from 1,826 producing wells, an average daily run for the state of 53,477 bbls. This was the eleventh consecutive month in which production had exceeded 1,200,000 bbls., with a 21-month average of 1,475,826 bbls.

The Allegan and Clayton fields stepped up daily production by about 1,000 bbls., Porter and Greendale showed lesser increases, and the new Bentley field in Gladwin County was beginning to get under way. High hopes were held of major production in the newly discovered Edenville district of Midland County before the summer's end. The rich Buckeye field in Gladwin County, responsible for about half of the state's production, held steady in February with a rise of only 66 bbls. a day over January. The Sherman field, Isabella County, showed a small decline, traceable to bad weather conditions.

Figures on February runs:

Pool—	Wells	Av. daily runs (bbls.)
Porter-Yost	423	8,304
Greendale-Chippewa	260	1,687
Geneva (Midland)	3	27
Edenville (Midland)	1	120
Vernon-Leaton-Denver	94	1,544
Sherman (Isabella)	57	4,457
Montcalm County	52	926
Beaverton (Gladwin)	23	272
Bentley (Gladwin)	5	261
Buckeye (Gladwin)	372	26,694
Secord (Gladwin)	1	7
Ogemaw County	214	2,784
Adams (Arenac)	7	185
Clayton (Arenac)	42	1,354
Saginaw-Hemlock	57	46
Birch Run (Saginaw)	25	67
Dundee (Monroe)	3	25
Allegan County	66	4,582
Muskegon County	91	135
Totals	1,826	53,477

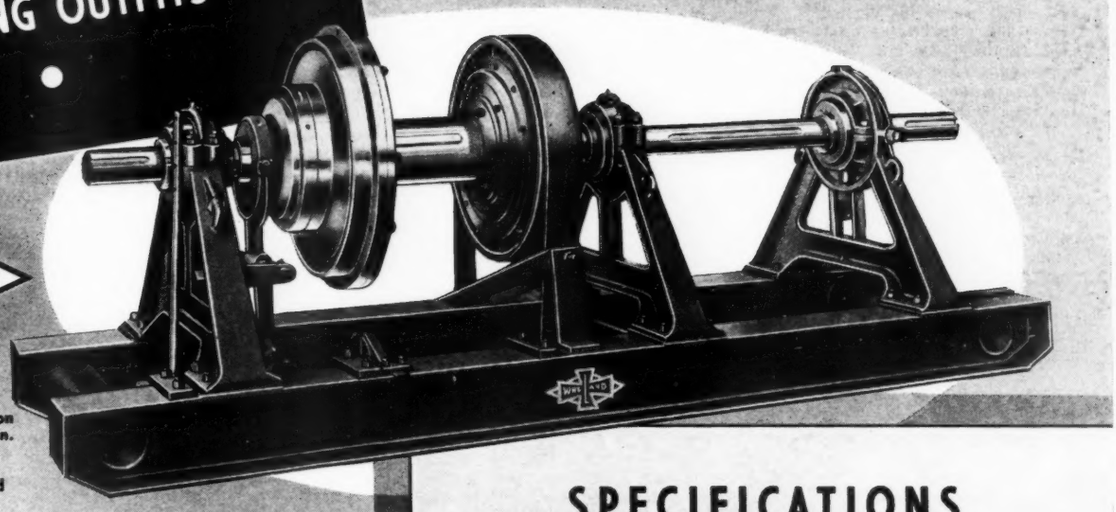
(Continued on Page 138)



MODEL B-7000

Wheland-Lucey REVERSE CLUTCH

FOR INTERNAL COMBUSTION ENGINE-POWERED ROTARY DRILLING OUTFITS



FEATURES

- Dodge Diamond "D" Friction Clutch for forward rotation.
- Bevel Gears with Brake Drum for reverse.
- Cut Tooth Steel Gears and Pinions.
- Timken Tapered Roller Bearings.
- Grease-tight Sealed Lubrication.
- 10" H-Beam Sled Type Skids.
- All Welded Construction.

The Model B-7000 Reverse Clutch is an important addition to the famous line of Wheland-Lucey rotary drilling equipment which has paced the development of the trend toward internal combustion engine powered mechanical drilling rigs.

The Model B-7000 Reverse Clutch combines many years of field experience with engineering design, to produce a unit of unusual strength, flexibility and performance. It is simple, rugged and safe; specially adapted for use with Gas or Diesel Engines, and adaptable for either V-belt or chain drive.

DISTRIBUTORS:

Lucey Products Corporation, Tulsa, Oklahoma
Houston Oil Field Material Co., Inc., Houston, Texas
Murray-Brooks Hardware Co., Ltd., Lake Charles, Louisiana
Frick-Reid Supply Corporation, Tulsa, Oklahoma

SPECIFICATIONS

Maximum recommended forward speed of clutch, 400 R.P.M.
Maximum recommended reverse speed of clutch, 330 R.P.M.

Horsepower safely transmitted in forward direction including factor of safety of 4 and of 3

100 R.P.M.	95 H.P.	125 H.P.
200 R.P.M.	190 H.P.	250 H.P.
300 R.P.M.	285 H.P.	375 H.P.
400 R.P.M.	380 H.P.	500 H.P.

Note:—For this class of work Wheland recommends using a factor of safety of 4 for their clutch.

Horsepower of reversing gears at:
330 R.P.M. of shaft ..... 160 H.P.

Lubrication required for gear housing is
1 Gal. of SAE-250 Gear Oil

Net Weight, Lbs.	6575
Weight crated for export, Lbs.	7300

Write for Bulletin No. 155

EXPORT: Lucey Export Corporation, 3505 Woolworth Building, New York, N. Y.; Broad Street House, London, E. C. 2, England

THE WHELAND COMPANY

ROTARY DRILLING EQUIPMENT

Chattanooga, Tenn.

California Field Report

By
L. P. STOCKMAN

California Fails to Reduce Production to Requirements

LOS ANGELES, Calif., Mar. 14.—California producers failed to lower their crude output to a figure anywhere near demand in the past week. In the previous week production was reduced from an average of 746,200 bbls. to 727,500 bbls., but the average for the week ending Saturday, March 12, was 725,200 bbls. a day, which did not help the acute crude situation a bit. Conservative producers had asked for a cut-back to 694,600 bbls. which was the Bureau of Mines estimate of daily crude requirements in March, but the consideration they were given is shown by the reduction of 2,300 bbls. a day from the production for the week ending March 5.

Superior Oil Co. focused the attention on the Rio Bravo field in Kern County a few days ago when its No. 1 Wagner in section 35-28-25 came in flowing 800 bbls. of clean 38.1-gravity oil and 1,500,000 feet of gas per day on a combination production and water-shutoff test. This well, which was killed several hours later to permit further drilling into the Rio Bravo zone, was bottomed at 11,265 feet with 7-inch casing cemented at 11,246 feet. During the well's short flow test through a 9/64-inch bean it showed a tubing pressure of 2,000 pounds and a casing pressure of 1,650 pounds. Production came from 18 feet of oil sand, with the hole open below the shoe of the 7-inch water string. Union Oil Co.'s discovery well in the Rio Bravo field was completed flowing 2,500 bbls. per day from 11,302 feet with 55 feet of oil sand open. It is pinched back to 460 bbls. per day. There are seven wells drilling in the field including Superior Oil Co. No. 1 Wagner and since all seven are below 9,000 feet the entire group should be completed within 30 days.

World's Deepest Well

Continental Oil Co. has reached 14,112 feet in No. 2-A Kern County Land, the deepest well in the world, in the Wasco district of Kern County, in section 8-27-24, and is still rotating ahead. It is the intention of the company to continue drilling until the bit has passed out of the present shale body in the hope that a productive sand may be picked up. The wildcat has not shown any indications of production although several minor oil and gas showings have been logged.

In the Semi-Tropic gas field, Standard Oil Co. has placed No. 2 Randolph in section 14-27-23 on a compressor and the deep well is flowing 25 bbls. of crude oil and 35 bbls. of water per day from 7,630 feet. This well was carried down as a deep test to 9,536 feet but plugged back to the completion depth. This is the only oil produced in this field up to the present as previous production higher up consists of a dry commercial natural gas. The fact that a small quantity of crude oil has been produced may, however, stimulate additional deep drilling in the area.

Wilmington

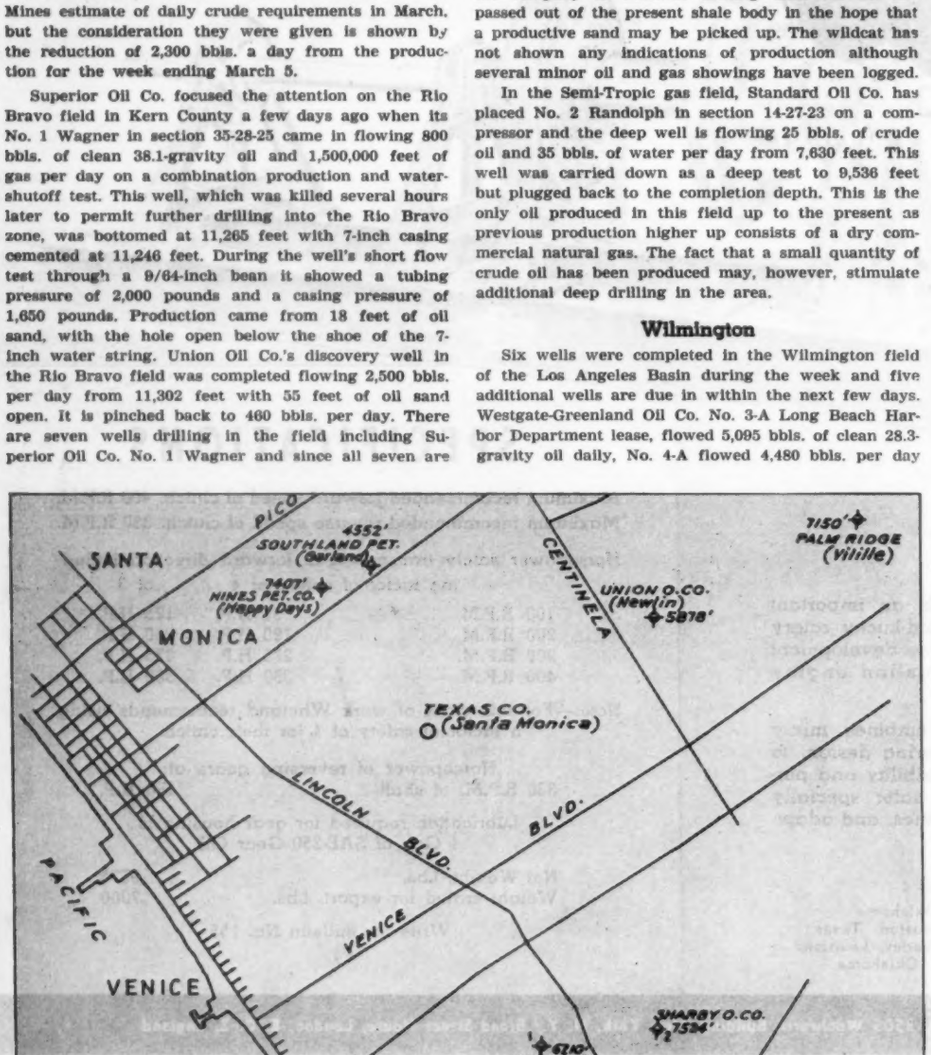
Six wells were completed in the Wilmington field of the Los Angeles Basin during the week and five additional wells are due in within the next few days. Westgate-Greenland Oil Co. No. 3-A Long Beach Harbor Department lease, flowed 5,095 bbls. of clean 28.3-gravity oil daily, No. 4-A flowed 4,480 bbls. per day of clean 28.5-gravity oil from 3,888 feet. Both wells are producing from the Upper and Lower Terminal zone with the shallow Ranger zone blanked off. No. 3-A is flowing through a 25/64-inch bean and the hole contains 385 feet of 18⅝-inch; 2,331 feet of 13⅜-inch and 3,885 feet of 8⅝-inch casing. No. 4 was finished with a string of 8⅝-inch landed on bottom and carrying perforations at 2,841-3,340 feet and at 3,381-3,888 feet and was cemented through perforations at 2,835 feet and 3,380 feet.

General Petroleum Corp. No. 3-5 Channel Community was finished flowing 110 bbls. of relatively clean 14.6-gravity oil daily from 3,310 feet after the hole had been finished with 649 feet of 5¾-inch liner including 330 feet of perforated landed on bottom and gravel packed behind the liner. General Petroleum Corp. No. 9 Harbor Community was completed flowing 290 bbls. of 17.2-gravity oil daily from 3,025 feet. Union Pacific Railroad Co. has eight new derricks up and has staked three additional locations. The company completed No. 48 flowing 1,434 bbls. of exceptionally clean 24.4-gravity oil daily from 2,968 feet. This new well, which is flowing under a tubing pressure of 430 pounds and a casing pressure of 820 pounds, was finished with 375 feet of 6⅝-inch liner landed at 2,957 feet and including 60-mesh perforations at 2,608-2,822 feet and at 2,851-2,957 feet.

Gus Pongratz, drilling for the Brookline Oil Co., completed No. 2 Gilmore flowing 580 bbls. of 17.2-gravity oil cutting 3.5 per cent daily from 3,659 feet. It was finished with 781 feet of combination 6⅝-inch and 5¾-inch liner carrying perforations at 2,980-3,080 feet, 3,150-3,250 feet, 3,325-3,585 feet and at 3,628-58 feet and was cemented through perforations at 3,628 feet. A string of 3,579 feet of 2½-inch tubing with a packer was set at 2,416 feet.

Tideland litigation, due to disputed ownership of tidelands in the Wilmington and Long Beach harbor districts, has resulted in the introduction of a bill at the special session of the California legislature which convened in Sacramento March 7. The bill, which has not yet been voted on, is designated as the State Lands Act of 1938, contemplates the creation of a State Lands Commission consisting of the state comptroller, director of natural resources and director of finance. Some criticism has arisen with respect to certain provisions of the act and the power granted the proposed commission, and the bill may be amended before enactment. The outcome of the tideland litigation will affect a number of operators who have either started drilling or have completed producing wells in close proximity to the Los Cerritos ship channel, as the contested area extends northward of its present limits.

Westgate-Greenland Oil Co., which completed two large flowing wells in the past week and which expects to finish two more within a few days, will be one of those operators affected by the proposed legislation. This company is drilling on acreage leased from the city of Long Beach which calls for a 50 per cent royalty payment of all oil and gas produced. In addition to this large royalty the company paid the city of Long Beach a substantial cash bonus. Any changes in ownership of the acreage involved may result in additional litigation. Practically all wells in the Long Beach section of the Wilmington field have been restricted to the existing maximum well production of 2,000 bbls. per day but with a number of additional wells expected within the next fortnight it is probable that operators will be obliged to substantially reduce the maximum well production if they hope to maintain the prevailing price structure for crude and refined oil.



The Texas Co. has petitioned the Los Angeles Planning Commission for a permit to drill a wildcat in the Santa Monica-Ocean Park district of Los Angeles Basin where a geophysical high has been found and acreage leased in anticipation of a favorable decision. The case is under advisement by the commission

Belridge-Lost Hills

Tidewater Associated Oil Co. completed No. 7 Re-

ward in section 34-27-20, North Belridge field, Kern County, flowing 1,716 bbls. of clean 32.1-gravity oil and 3,381,000 feet of gas per day through two 1½-inch beans, while No. 2 in section 21-27-20 finished flowing 614 bbls. of clean 32.2-gravity oil and 878,000 feet of gas per day through a 1½-inch bean under a tubing pressure of 735 pounds and a casing pressure of 200 pounds. No. 7 Reward was completed at 8,891 feet and finished with 864 feet of 5¾-inch liner landed on bottom and carrying perforations at 8,205-8,328 feet and at 8,471-8,891 feet. No. 2 was bottomed at 8,711 feet and completed with 631 feet of 5¾-inch liner including 373 feet of perforated landed at 8,708 feet.

Belridge Oil Co., first operator to develop substantial production in the Temblor and Wagon Wheel zones, expects to complete No. 7 in section 27-27-20 within the next few days as the bit is in the pay at 8,366 feet. Richfield Oil Corp. has just passed the 8,000-foot level in No. 1-A Belridge in section 22-27-20 and should conclude drilling operations within the next two or three weeks. This is the company's initial well in the North Belridge field and it is believed quite probable that it will result in commercial production. Texas Co. No. 2 Martin, which started at 1,340 bbls. of clean 38.6-gravity oil daily along with 9,200,000 feet of gas, has been pinched down to 415 bbls. of oil and 3,480,000 feet of gas per day through a 4/64-inch bean under a tubing pressure of 1,600 pounds and a casing pressure of 2,300 pounds. No. 3 Martin is rotating ahead in brown shale at 6,700 feet, and a derrick for No. 4 Martin has just about been completed.

Greeley-Ten Section

Standard Oil Co.'s deep test in the Greeley field of Kern County after having been retarded several days with a fishing job at 10,270 feet, is again making hole and should reach the 10,350-foot level early this week. This test, No. 11-2 Kern County Land, in section 20-29-26, failed to find the Greeley zone productive and is being carried down in search of a zone comparable with the Rio Bravo sand discovered by Union Oil Co. in the Rio Bravo field last year at 11,302 feet. Standard Oil Co. is running seven strings of tools in the Greeley field and is moving in rotary drilling equipment in No. 11-14 Kern County Land in section 18-29-26. No. 1 Ross, in section 20-29-26, is standing rigged up ready for early work.

Shell Oil Co. spudded in No. 41-A Kern County Land in the Ten Section field of Kern County and completed No. 41-B Kern County Land in section 32-30-26, flowing 2,425 bbls. of relatively clean 31.9-gravity oil and 1,790,000 feet of gas per day through an open line from 8,216 feet. This is the most easterly well on Shell's Kern County Land lease B. Shell is building rigs for No. 34-A Kern County Land in section 30-30-26 and No. 25-B Kern County Land in the same section. No. 52-B Kern County Land in section 31-30-26 which Shell finished last week flowing 509 bbls. of 31.9-gravity oil and 262,000 feet of gas per day from 8,160 feet has been restricted to 260 bbls. of oil and 195,000 feet of gas by reducing the bean from 32/64-inch to 20/64-inch.

Ventura Avenue

Two wells were completed in the Ventura Avenue field. Shell Oil Co. completed No. 93 Taylor flowing 3,640 bbls. of clean 30.5-gravity oil and 3,190,000 feet of gas initially through open line from 8,114 feet. This is the second large flowing well on the Taylor property in the past 60 days as No. 92 in the extreme western end of the property was previously completed flowing 3,840 bbls. per day. Shell Oil Co. recently acquired an undivided 35 per cent of the mineral rights in fee of the Taylor lease involving approximately 1,500 acres, for a cash consideration of $1,842,105. Tide Water Associated Oil Co. has completed No. 79 Lloyd flowing 330 bbls. of 28.2-gravity oil and 410,000 feet of gas per day on a compressor from 5,005 feet. This shallow zone completion was finished with 174 feet of 5-inch liner carrying 121 feet of perforated landed at 5,000 feet. This company's No. 18 Hartman completed a week or two ago is at present flowing 990 bbls. of 30.6-gravity oil and 1,090,000 feet of gas per day through a 44/64-inch bean under a tubing pressure of 195 pounds and a casing pressure of 680 pounds.

Plans are being made to erect a small asphalt- and road-oil plant in the vicinity of Oxnard in Ventura County and if these are carried out, Vaca Oil Co. and other operators will undertake additional development near Oxnard where small production of heavy crude oil has been found. This heavy oil is so viscous that it cannot be pumped in its crude state

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but this has been overcome to some extent by introducing distillate in the hole. Saturated steam failed to have any affect on the heavy tarry mass but the distillate cuts the oil and by reducing the viscosity permits the pumping of a small amount of oil daily.

Montebello

Development work in the extreme western end of the Montebello field is getting under full swing and several wells will be started soon. St. Helens Petroleum Co., which proved the existence of substantial production in the Miocene at a comparatively shallow depth on its Monterey lease in the west end of the field, is running two strings of tools and has just staked location for another well. The company's two drilling wells are Nos. 24 and 25 on the Monterey lease, the former going ahead at 5,110 feet and the latter at 700 feet. The new location, which will soon appear as a derrick, is No. 26 Monterey. Union Oil Co. is making good progress in its No. 1 Paul Howard and is building derrick for No. 1 Wilcox which is situated one location to the east. This acreage is south of St. Helens Petroleum Co.'s Monterey lease on which the discovery well is still flowing about 650 bbls. per day. McVicar and Rood took over the Manz lease drilled several years ago by Superior Oil Co. and have salvaged some of the original hole. This well is located west and south of the deep zone discovery well and appears to be well located structurally. Brookline Oil Co. has recently acquired some acreage in the west end of the Montebello field and officials of the company are making preparations to begin drilling operations on one well within the next few weeks. Rig foundation was poured a few days ago and rig construction should be started at once. This location also appears, on the basis of the limited data available, to be located on structure. It remains to be seen, however, just how far south the productive limits will extend although it is quite obvious that the structure must have a certain amount of width to permit the existence of a long structure. The west end of the new area looks better and the productive area may extend westward for several thousand feet. No deep tests have been drilled out beyond the upper limits of production and consequently it is conjectural just how far westward the new sand extends.

Torrance

One new well and a recompletion were recorded in the Torrance field and two deep zone completions are expected this week. There are 29 wells in this field either being deepened or headed down from the grass roots. M. & M. Oil Co. completed a new well this week when No. 1 Lomita was brought in pumping 174 bbls. of relatively clean 26.3-gravity oil per day on the beam from 5,130 feet. This well was carried down from the grass roots and the hole finished with a 5¾-inch water string landed at 5,130 feet and then gun perforated after the cement job. Neal H. Anderson, former California oil umpire, successfully recompleted his No. 4 pumping 180 bbls. of 25.9-gravity oil per day after redrilling and deepening the hole to 5,005 feet. A string of 5¾-inch casing was run in and landed at 5,005 feet and then perforated at 4,852-72 feet and at 4,930-45 feet.

Coastal Area

In the Santa Maria Valley field, Union Oil Co. completed No. 2 Frank Vicente in section 21-10-34 at 4,986 feet after landing a string of 8⅝-inch casing at 4,688 feet for a water shutoff and 4,959 feet of 3-inch tubing. The well is still pumping to sump and consequently no gauge will be available until production is turned into tanks. Three wells were completed in the Santa Maria field but one of them, Union Oil Co. No. 20 Squires, was subsequently taken off production for a clean-out job. This well was finished earlier in the week pumping 210 bbls. of 22.1-gravity oil daily from 4,300 feet. In the Santa Maria Valley field, F. E. Jones completed No. 1 Wisconsin pumping 165 bbls. of clean 15.6-gravity oil per day from 4,600 feet and Joseph Anderson successfully completed No. 1 A. & T. pumping 360 bbls. of 15.8-gravity oil daily from 5,329 feet. The latter well was still showing a rather high cut at last reports and may require some corrective work on the cement job. Wilshire Oil Co. is nearing the top of the gas zone in No. 1 Hollister in the Gaviota district of Santa Barbara County where 101 Oil Co. proved up the existence of a wet gas zone in 1937. These two wells are close to each other in section 35-5-33.

Los Angeles Basin

The A. T. Jergins Trust recompleted No. 21 Municipal in the Long Beach field of Los Angeles Basin and returned it to production, pumping 170 bbls. of 25.1-gravity oil per day from 4,487 feet. Production is still cutting rather high. In the Santa Fe Springs field, Union Oil Co. No. 100 Bell, bottomed at 11,314 feet but plugged back to 9,945 feet, is flowing approximately 65 bbls. of fluid per day through a 35/64-inch bean. Production is cutting more than 60 per cent water and while this is a new zone below present productive horizons it apparently is not commercially productive. It will require further testing because it is not impossible that the head of water is retarding oil production. Up in the Midway-Sunset field of the San Joaquin Basin in Kern County, Texas Co. completed No. 30 in section 32-32-24, pumping 257 bbls. of 15.8-gravity oil per day from 3,245 feet.

Eastern Fields

(Continued from Page 116)

drilling the test on the Rozella Shamblin and others lease. In Union district, the Columbian Carbon Co. is down 1,195 feet in the Nelson H. Cavender test. The West Virginia Gas Corp. has started drilling the J. E. Layne and others test.

Deep Tests

In Jackson County, the Potter Development Co. found a fair volume of gas in the Injun sand in the deep test on the William T. Chancey farm in Ripley district. Water is in the hole with the gas and casing will be lowered. In Ravenswood district, W. T. Petry was able to move lost fishing tools up the hole, but is retarded by the gas coming from the Oriskany sand.

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	March 4		February 25			
	Total this week	Daily average	Total last week	Daily average	This week to date	Same time last year
Intercoastal-domestic—						
Diesel and gas oil	.....	.....	.....	.....	.....	176,726
Gasoline	.....	.....	.....	.....	344,116	286,012
Kerosene	.....	.....	.....	.....	59,885	.....
Foreign exports—						
Crude oil	735,080	105,013	527,859	75,408	3,827,088	1,922,585
Fuel oil	330,907	47,272	305,750	43,691	1,241,219	2,248,076
Diesel and gas oil	94,248	13,464	227,336	32,477	754,569	1,289,330
Gasoline	135,489	19,356	97,018	13,860	1,026,079	1,114,551
Kerosene	.....	.....	18,387	2,626	166,162	588,107
Other unfinished oil	.....	.....	.....	.....	.....	156,531
Coastwise-domestic—						
Crude oil	223,067	31,877	409,202	58,457	1,847,100	1,078,013
Fuel oil	149,005	21,272	348,778	49,825	2,274,139	2,403,909
Diesel and gas oil	33,145	4,735	18,667	2,667	282,960	503,444
Gasoline	406,187	59,027	285,743	40,820	2,497,427	1,988,280
Kerosene	.....	.....	.....	.....	42,756	25,314

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Diesel and gas oil	.....	.....	.....	.....	178,662	75,895
Gasoline	.....	.....	.....	.....	.....	25,778
Asphalt	.....	.....	73,449	10,493	.....	.....
Foreign exports—						
Crude oil	104,217	14,888	75,383	10,769	760,177	656,297
Fuel oil	95,880	13,697	58,684	8,383	256,214	254,876
Diesel and gas oil	31,108	4,444	31,945	4,564	181,973	458,232
Gasoline	185,316	26,474	387,699	55,386	878,417	1,023,158
Kerosene	.....	.....	24,609	3,515	110,450	137,295
Lubricants	44,474	6,353	38,158	5,451	82,632	124,377
Coastwise-domestic—						
Fuel oil	72,612	10,373	161,214	23,030	1,139,282	1,176,787
Diesel and gas oil	.....	.....	30,849	4,407	332,801	108,023
Gasoline	103,341	14,763	123,804	17,686	1,181,710	806,527
Kerosene	.....	.....	19,161	2,737	154,097	21,509

STANDARD OIL CO. OF CALIFORNIA AND UNION OIL CO

Crude oil prices at the well effective June 22, 1936

Gravity—	Signal Hill (Long Beach)	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Dominguez	Elwood Terrace	Torrance	Richfield	Whittier E. Coyote (La Habra)	Montebello	W. Coyote Hills	Santa Fe Springs	Mountain View	Elk Hills Buena Vista Hills Midway-Sunset Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills	Santa Paula*	Orcutt*
14-14.9	$.80	$.79	$.74	$.78	$.79	$.80	$.76	...	...	...	$.80	$.76	$.76	$.77	$.78	...	...	$.70	$.70	$.70	...	...	$.70	...
15-15.9	.80	.79	.74	.78	.79	.80	.76	...	...	...	.80	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.70	...
16-16.9	.80	.79	.74	.78	.79	.80	.76	...	...	...	.80	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.70	$.70
17-17.9	.80	.79	.74	.78	.81	.80	.76	...	...	...	.80	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.71	.70
18-18.9	.80	.79	.74	.78	.84	.80	.78	...	...	...	.82	.76	.76	.77	.78	...	...	.70	.70	.70	...	...	.73	.72
19-19.9	.82	.79	.74	.82	.87	.84	.81	...	...	...	.85	.76	.78	.77	.78	...	$.70	.74	.74	.71	$.70	...	.75	.74
20-20.9	.85	.79	.74	.85	.90	.88	.84	...	...	...	.88	.78	.82	.77	.80	...	.70	.78	.78	.72	.70	...	.77	.77
21-21.9	.88	.79	.74	.89	.93	.93	.88	...	...	...	.91	.80	.85	.77	.84	$.78	.73	.82	.82	.74	.70	...	.79	.80
22-22.9	.92	.82	.74	.92	.96	.98	.92	...	...	...	.93	.84	.89	.79	.88	.78	.77	.87	.86	.78	.72	...	.82	.83
23-23.9	.95	.86	.77	.96	.99	1.02	.96	$.84	$.79	...	.96	.88	.93	.82	.92	.78	.80	.92	.90	.82	.76	...	.85	.86
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	...	.99	.91	.96	.85	.96	.82	.84	.97	.94	.86	.79	...	.87	.88
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	...	1.02	.95	...	.89	.99	.86	.88	1.01	.98	.90	.83	...	.90	.91
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	...	1.05	.98	...	.92	1.03	.90	.91	1.06	1.02	...	...	...	.92	.93
27-27.9	1.10	1.05	.88	1.11	1.12	...	1.10	1.03	.88	...	...	1.02	...	.96	1.06	.95	.95	1.10	1.06	...	...	...	.95	...
28-28.9	1.14	1.10	.90	1.14	1.15	...	1.14	1.07	.90	...	...	1.06	...	.99	1.10	.99	.99	1.15	1.10	...	...	...	.97	...
29-29.9	1.17	1.15	.93	1.18	1.18	F.O.B.	1.17	1.12	.93	...	...	1.09	...	1.03	1.14	1.03	1.02	1.20	1.14	...	...	...	.99	...
30-30.9	1.21	1.19	.95	1.22	1.21	our	1.21	1.17	.95	F.O.B.	...	...	...	1.07	1.17	1.08	1.06	1.25	1.18	...	...	...	1.01	...
31-31.9	...	...	...	...	1.24	Pipe	1.24	1.22	.97	Ship	...	...	...	1.11	1.21	1.12	1.09	1.29	...	...	...	...	...	...
32-32.9	...	...	...	...	1.27	Line	1.27	1.27	1.00	...	...	...	...	1.14	1.25	1.16	1.13	1.34	...	...	...	...	...	...
33-33.9	...	...	...	...	...	...	...	1.32	...	$1.28	...	...	...	1.18	1.28	1.20	1.17	1.38	...	...	...	$1.19	...	...
34-34.9	...	...	...	...	...	...	...	1.37	...	1.32	...	...	...	1.22	1.32	1.25	1.20	...	...	...	...	1.23	...	...
35-35.9	...	...	...	...	...	...	...	1.42	...	1.35	...	...	...	1.25	...	1.29	...	...	...	...	...	1.27	...	...
36-36.9	...	...	...	...	...	...	...	1.46	...	1.39	...	...	...	1.29	...	1.33	...	...	...	...	...	1.31	...	...
37-37.9	...	...	...	...	...	...	...	1.51	...	1.43	...	...	...	1.32	...	1.37	...	...	...	...	...	1.35	...	...
38-38.9	...	...	...	...	...	...	...	1.56	...	...	...	...	...	1.36	...	1.42	...	...	...	...	...	1.39	...	...
39-39.9	...	...	...	...	...	...	...	1.61	...	...	...	...	...	1.40	...	...	...	...	...	...	...	1.43	...	...
40-40.9	...	...	...	...	...	...	...	1.66	...	...	...	...	...	1.43	...	...	...	...	...	...	...	...	...	...

Newhall, McKittrick, Kern River, Kern Front and Round Mountain, 70 cents for all grades. *Posted by Union Oil Co. Same company's Brea Canyon schedule stops at $1.14 for 28 degrees and over, and Belridge and Lost Hills schedule stops at $1.32 for 37 degrees and over. By Standard Oil Co., effective October 15: El Segundo, 14 to 18.9 degrees, 80 cents; 19-19.9, 82 cents; 20-20.9, 85 cents; 21-21.9, 88 cents; 22-22.9, 92 cents; 23-23.9, 95 cents; 24-24.9, 99 cents; 25-25.9, $1.03; 26-26.9, $1.06; 27-27.9, $1.10; 28-28.9, $1.14; 29-29.9, $1.17; 30-30.9, $1.21. Wilmington, 14 to 16.9, 75 cents; 17-17.9, 77 cents; 18-18.9, 79 cents; from 19 degrees upward, prices same as Signal Hill.

Kansas Developments

By
DAL DALRYMPLE

Open New Stafford Oil Pool; Big Kingman County Gasser

Wildcats claimed attention of Kansas operators the past week, but interest was shared with a big oil well in Cowley County and a large gasser in Kingman County. Little increase was shown in activity in proven areas, drilling being confined largely to offsets and lease requirements.

A new oil area was opened about 9 miles north of St. John, in Stafford County, at Stanolind Oil & Gas Co. No. 1 Hahn, NE NE NW section 14-22-13w. It swabbed 38 bbls. of oil in two hours from Arbuckle lime topped at 3,753 feet, total depth 3,763 feet. Oil rose 3,200 feet in the hole in 4½ hours. Three offset tests will be required. Nearest production is in the Drach pool, about 1 mile to the east.

Another extension well was completed in the Geneseo field, Rice County, at Continental Oil Co. No. 2 Pickerill, SE SW SE section 13-18-8w. It was rated potentially at 2,157 bbls. of oil daily, producing naturally from Arbuckle lime at 3,232 feet, total depth.

A McPherson County wildcat that was hailed as a certain pool opener early in the week was not looking so promising at the week-end, although operators still were hopeful of completing a producer. It was Darrah and others No. 1 Decker, SW SW SE section 12-21-2w, about 2½ miles northwest of the Graber pool. After the crew had drilled plug at 3,005 feet, in chat, it blew in with an estimated 3,000,000 feet of gas and sprayed oil. After being shut in for a few hours, it was reopened and operators reported fluid had risen 2,600 feet in the hole, about 100 feet of the fluid being oil and the remainder water. Operators were to drill ahead with cable tools to test deeper formations.

The deepest test in Kansas, Olson Oil Co. No. 1 Watkins, SW SW NW section 23-32-21w, Clark County, was scheduled for abandonment at 7,136 feet, total depth, in Arbuckle lime. It had small showings of oil in Viola lime, but attempts to make a producer were unsuccessful.

In Woodson County prospects were bright for the opening of a new producing area at Union Oil & Royalty Co. No. 1 Laidlow, NW NE SW section 35-25-15, wildcat 3 miles south of Yates Center. It was showing oil from second break in Mississippi lime, topped at 1,397 feet, total depth 1,405 feet. Operators were preparing for completion test.

Colonial Oil Co. and associates No. 1 Hagy, NW NW SW section 16-16-10w, Ellsworth County, was rated at 1,219 bbls. of oil daily from Arbuckle lime at 3,343-56 feet. It extends the Stoltenberg pool three-fourths mile northwest.

All oil pools in Chautauqua, Montgomery and Elk counties were exempted from proration restrictions in an order issued by the Kansas Corporation Commission. Testimony showed that of 4,604 producing wells in the three counties only 40 were capable of producing more than 15 bbls. of oil daily, and that there is a market demand for all production in the area.

A. H. Russell of Warren, Pa., bought the holdings of F. A. Gillespie & Sons, of Tulsa, in the Faubin area of Rooks County. The purchase includes the No. 1 Faubin, NE NE NW section 12-6-18w, discovery well in the Faubin pool, and 2,320 acres of leases surrounding the well, which has potential of 356 bbls. of oil from Lansing lime at 3,161 feet, total depth. The consideration was $500,000 in oil, to be paid out of one-eighth of oil produced. Mr. Russell also agreed to drill two Arbuckle lime tests.

Considerable leasing and exploration activity is reported in northeastern Kansas. Leases are being taken in Washington, Clay, Riley, Pottawatomie, Cloud and Ottawa counties. Geographical and seismograph crews were reported active in Cloud and Clay counties.

Wildcat Completions

Although several Kansas wildcats were showing as probable pool openers, those listed as completions the past week were failures.

Emrich and others No. 1 Anderson, NE SE SW section 33-15-11w, Russell County outpost, was spudded and abandoned.

H. V. Elwell and others No. 1 Zimmerman, NE NE NW section 15-9s-18w, Rooks County wildcat, topped Kansas City lime at 3,258 feet and had a slight showing of oil at 3,300-05 feet. Conglomerate was topped at 3,505 feet, Simpson 3,720 feet, Arbuckle lime 3,740 feet, total depth 3,760 feet, and it was dry and abandoned.

R. E. Hess and others No. 1 Reinhardt, NE NE SW section 36-12-14w, Russell County wildcat, found Simpson sand at 3,113 feet, Arbuckle lime 3,140 feet, water intruded and it was dry and abandoned at 3,165 feet.

Martin & Foraker and others No. 1 Dick Estate, SW SE SW section 31-19-11w, Barton County wildcat, was an abandoned location.

Cardinal Oil Co., Carraker and others No. 1 Sittner, SW cor. section 4-22-12w, wildcat in Stafford County, topped Kansas City lime at 3,337 feet and had slight showings of oil at 3,410-15 feet, 3,460-65 feet, 3,535-40 feet and 3,575-80 feet. Simpson zone was topped at 3,627 feet, Arbuckle lime 3,686 feet, was bottomed at 3,700 feet, swabbed a small amount of oil but water predominated and it was abandoned.

Archer & Crane No. 1 Templin, NW NW SE section 32-17-3w, McPherson County wildcat, found Simpson sand at 3,566 feet, Arbuckle lime 3,632 feet, total depth 3,652 feet, water intruded and it was abandoned.

E. B. Shawver No. 1 Stewart, NW NW SE section 4-32-3w, Sumner County wildcat, had Simpson sand at 4,407 feet with a small showing of oil, found Arbuckle lime topped at 4,505 feet dry and was abandoned at 4,569 feet.

Hugh T. Jones and others No. 1 Stunkel, SE SE SW section 2-30-1w, and Saco Oil Co. and others No. 1 Phipps, SW SE NE section 24-30-1w, Sumner County wildcats, were abandoned locations.

Tom Palmer No. 1 Neimaller, NE cor. section 14-30-4, wildcat in Cowley County, topped Bartlesville sand at 2,780 feet, Mississippi lime at 2,874 feet and was dry and abandoned at 2,962 feet, total depth.

Steinbuchel and others No. 1 Fox, NW SE NE section 25-26-3, Butler County wildcat, was abandoned at 1,010 feet, total depth.

Ellis County

Deep Rock Oil Corp. No. 28 Baumer, NE NE SE section 27-11-17w, Bemis field, Ellis County, had Arbuckle lime at 3,393 feet, was bottomed at 3,409 feet, and made potential of 3,339 bbls. of oil, completed.

Magnolia Petroleum Co. No. 10 Johansen, SE NE SE section 22-11-17w, made potential of 2,203 bbls. of oil and was completed at 3,372 feet, total depth. Top of Arbuckle lime was 3,368 feet.

Shell Petroleum Corp. No. 4 Rumsey, NE NW NW section 23-11-17w, had Arbuckle lime at 3,360 feet, total depth 3,379 feet, and was completed for potential of 2,342 bbls. of oil.

Champlin Refining Co. No. 1 Glatheart, NW SW SE section 29-11-17w, found Arbuckle lime pay at 3,618-31 feet, total depth, was acidized, swabbed 45 bbls. of oil an hour, was reacidized and completed for potential of 1,281 bbls. of oil.

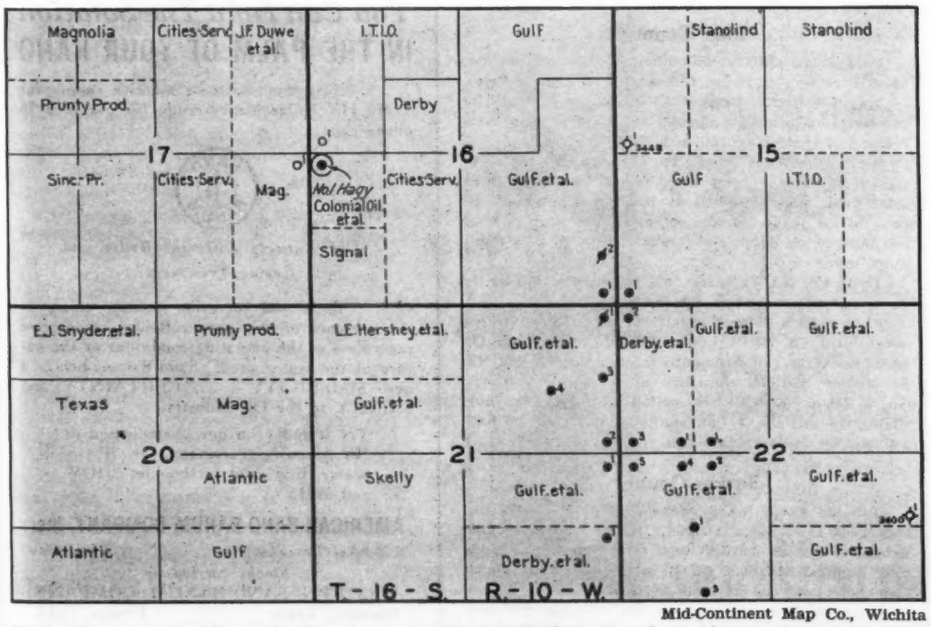
Phil-Han Oil Co. and Seeley No. 1 Smith, Fairport area, topped Arbuckle lime at 3,405 feet, had a hole full of water at 3,405-10 feet, total depth, and was abandoned.

J. J. Hall No. 2 Smith, SE NE NW section 14-12-16w, was an abandoned rig.

Margay Oil Co. No. 8 Johnson, NE SE SE section 22-11-17w, had dug pits; Shell Petroleum Corp. No. 5 Rumsey, SW SW NW section 23-11-17w, set 15-inch casing at 300 feet; Margay Oil Co. No. 4 Bemis E, NE NW NW section 28-11-17 28-11-17w, was a location; Atlantic Oil Investment Co. No. 1 Jensen, SW cor. section 12-12-18w, was a rig.

Russell County

Three new producers were completed in Russell County. Gulf Oil Corp. No. 10 Michaelis, SW cor. sec-



Mid-Continent Map Co., Wichita

Stoltenberg pool, Ellsworth County, was extended three-fourths mile northwest in section 16-16-10w

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tion 32-15-13w, Trapp field, found Arbuckle lime at 3,349 feet, total depth 3,376 feet, was treated with acid, pumped 180 bbls. of oil and 53 bbls. of water in five hours and was completed for potential of 1,229 bbls. of oil, with 1 per cent water.

J. C. Shaffer, Inc., No. 6 Cram, NW NE SE section 11-14-15w, had Kansas City lime pay at 3,062 feet, total depth 3,075 feet, was acidized and made potential of 613 bbls. of oil.

Transwestern Oil Co. No. 3 Cram, NE SW SE section 11-14-15w, made potential of 890 bbls. of oil, with 141 bbls. of water, after acidizing. Top Arbuckle lime was 3,272 feet, total depth 3,279 feet.

Carter Oil Co. No. 1 Josephine, SE cor. section 7-15-13w, an old well, was deepened from 2,980 feet to Arbuckle lime at 3,205 feet, total depth 3,212 feet. It was acidized and recompleted for potential of 2,170 bbls. of oil.

New work in Russell County: W. C. McBride and others No. 3 Jellison, NW NE SW section 19-13-14w, rig; Central Petroleum Co. No. 7 Rouback-A, NE NW NE section 15-14-15w, rig; Gulf Oil Corp. No. 12 Hoffman, SW SE SW section 31-15-13w, rig; same company's No. 14 Hoffman, SE NW SW section 31-15-13w, rig; same company's No. 13 Hoffman, NW SE SW section 31-15-13w, rig.

Estimated Daily Production

Estimated daily production for Kansas for the week ending March 12, and for the preceding week, was as follows:

	Barrels	
	Mar. 12	Mar. 5
Oxford City	1,950	2,275
Burrton	11,250	10,950
Ritz-Canton	6,475	6,200
Graber	2,200	2,325
Hollow-Nikkel	3,675	3,025
Lerado	1,300	1,350
Voshell	2,975	2,500
Wellington	2,350	2,175
Ellsworth County:		
Lorraine	2,425	2,800
Other pools	1,245	1,200
Rice-Barton counties:		
Bloomer	2,700	2,575
Chase	5,725	5,525
Geneseo	2,025	1,650
Raymond	1,250	925
Silica	14,700	13,975
Silica—South	2,450	1,725
Keesling	975	1,150
Wherry	4,800	4,400
Miscellaneous Rice	3,700	3,675
Miscellaneous Barton	4,050	3,760
Russell County:		
Fairport	1,580	2,295
Gorham	1,620	1,810
Russell	2,039	860
Sullivan	6,211	6,550
Trapp	9,265	9,800
Miscellaneous Russell	7,410	8,285
Sedgwick County:		
Valley Center	1,035	1,015
Miscellaneous	2,865	1,755
Ellis County:		
Bemis	6,050	6,250
Miscellaneous	4,250	2,865
Kingman County	650	720
Stafford County	3,220	2,155
Greenwood County	9,250	9,000
Butler County	16,050	15,950
Other fields	23,385	22,405
Total Kansas	173.100	166,875

Rice County

Continental Oil Co. and others No. 2 Johnson, SE SE SW section 12-18-8w, Geneseo district, Rice County, found Arbuckle lime at 3,159 feet, total depth 3,240 feet, was acidized, pumped 483 bbls. of oil in four hours and made potential of 2,873 bbls.

Shell Petroleum Corp. No. 1 Lantz, SW SE NW section 32-20-7w, Wherry area, found Conglomerate at 3,333 feet, was bottomed at 3,350 feet, pumped 40 bbls. of oil in six hours, potential was estimated at 100 bbls. of oil daily, and it was completed as a minimum well.

Texas Co. No. 11 Kleile, NE NE SW section 34-19-10w, was an abandoned rig.

First reports of new activity in Rice County: Cities Service Oil Co. No. 1 Lewis, SW SE NE section 11-18-8w, location; same company's No. 1 Purcell, NE NE SE section 28-19-9w, location; Shell Petroleum Corp. No. 2 Zajic, SE NW NE section 13-18-8w, rig; Mid-Plains Oil Co. No. 1 Van Blarcom, C E half E half SW section 10-21-7w, location.

Barton County

Gulf Oil Corp. No. 3 Nicholas, NW NW SW section 12-20-11w, Silica district, Barton County, found Arbuckle lime at 3,275-83 feet, total depth, was acidized, pumped 328 bbls. of oil in the first four hours and made potential of 1,969 bbls. of oil.

Lebow & Bennett No. 2 Steckel, SW NW SW section 1-20-11w, was acidized and made potential of 1,886 bbls. of oil. Top of Arbuckle lime was 3,270 feet, total depth 3,275 feet.

Republic Natural Gas Co. No. 2 Bloomer-B, NW cor. section 14-17-11w, had Arbuckle lime at 3,329 feet, total depth 3,337 feet, was acidized, pumped 174 bbls. of oil the first four hours and made potential of 731 bbls. of oil.

New work in Barton County: Helmerich & Payne No. 1 Stettinger, SW NW NE section 1-16-14w, rig; Shell Petroleum Corp. No. 2 Marghein, NE NE NW section 12-16-14w, rig; same company's No. 2 Sausen, NE cor. section 13-16-14w, moving in rotary tools; Derby Oil Co. No. 13 Frees, SW SW NE section 3-17-11w, rig; Phillips Petroleum Co. No. 4 Kraft, NE NW NE section 10-17-11w, total depth 3,342 feet; Sinclair Prairie Oil Co. No. 2 Grosshardt, SE NE SW section 10-17-11w, moving in material; Stanolind Oil & Gas Co. No. 1 H. Schartz, NE NE SE section 34-19-11w, rigging up rotary.

Stafford County

Atlantic Refining Co. and Phillips Petroleum Co. No. 3 McNaghten-A, C E half E half NE section 27-24-13w, St. John pool, Stafford County, found Arbuckle lime at 4,091½ feet, and was bottomed at 4,100 feet. It swabbed 396 bbls. of oil in eight hours and made potential of 1,619 bbls. of oil.

Stanolind Oil & Gas Co. No. 1 Harms, NW NW NE section 13-22-13w, was acidized and was completed for potential of 1,985 bbls. of oil. Top of Arbuckle lime was 3,673 feet, total depth 3,682 feet.

Fain Drilling Co. No. 1 Hughes, SE cor. section 13-23-12w, was drilling below 1,000 feet. Pure Oil Co. No. 1 Krey, SW NW SE section 14-24-11w, was moving in material. Stanolind Oil & Gas Co. No. 1 Paulson, NW SW NE section 26-24-11w, was a rig. Same operator's No. 1 McComb, NE cor. section 27-24-11w, was rigging up rotary.

Kingman County

A large gas well was completed in the Kingman County sector of the Cunningham pool at Skelly Oil Co. No. 2 Conley, C W half NE SW section 20-27-10w. Viola lime was topped at 3,926 feet, total depth 3,950 feet. It produced 68,688,805 feet of gas. It is the largest gas well in the area and extends the pool one-fourth mile northeast.

Reno County

Shell Petroleum Corp. No. 5 Welch-A, C W half W half SW section 9-24-4w, Burrton district, Reno County, topped Chat at 3,296 feet and was bottomed in pay at 3,370-73 feet. It flowed 55 bbls. of oil and 5 bbls. of water in 18 hours; was acidized, pumped 152 bbls. of oil and 7 bbls. of water in eight hours and made potential of 344 bbls. of oil, with 30 bbls. of water.

Ellsworth County

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section 20-17-9w, Ellsworth County, swabbed 226 bbls. of oil in six hours, was acidized and made potential of 1,613 bbls. of oil. It had Arbuckle lime at 3,213 feet, total depth 3,218 feet.

Indian Territory Illuminating Oil Co. No. 1 Boye, SW SW NW section 16-16-10w, was a location. Magnolia Petroleum Co. No. 1 Boye, NE NE SE section 17-16-10w, was a location.

Harvey County

Wilhelm & Nye No. 1 Cunningham, NE NE SE section 19-23-3w, Burrton field, Harvey County, topped Chat at 3,256 feet, had pay at 3,360-69 feet, total depth, was acidized and pumped and flowed 847 bbls. of oil, with 15 bbls. of water, daily.

Derby Oil Co. No. 3 Lehman, SW SE NW section 13-22-2w, topped Arbuckle lime at 3,527 feet, total depth 3,680 feet, and was completed as a water disposal well.

J. W. Davisson No. 1 Morris, NW cor. section 32-23-3w, was an abandoned rig.

McPherson County

Leonard Page No. 1 Dixon, NE NW NW section 7-19-2w, was an abandoned rig in McPherson County.

Cowley County

The largest Cowley County oil producer of recent years was completed the past week at Earl Wakefield No. 2-A Wilson, NE NE NW section 4-32-3e, Weathered pool. It had Arbuckle lime at 3,225-44 feet, total depth, filled with oil and began flowing within 45 minutes after completion. It flowed 610 bbls. of oil the first four hours and made potential of 3,642 bbls. of oil naturally. It is the largest producer in the Weathered pool, which has 22 wells with total potential of 43,887 bbls. of oil.

Phillips Petroleum Co. No. 2 Starkey, NE NE SE section 16-30-4, had Bartlesville sand at 2,752 feet, total depth 2,788 feet, was shot and completed for potential of 240 bbls. of oil.

Sumner County

Sinclair Prairie Oil Co. No. 5 Herrick, SW NE SE section 15-35-2e, Sumner County, had Bartlesville sand pay at 3,435-42 feet, was shot and completed as a 15-bbl. producer.

Magnolia Petroleum Co. No. 2 Baird, C E half E half SW section 2-30-4w, was a rig.

Butler County

R. J. Wixson No. 1 Blakeman, NE NW SE section 4-28-6, Butler County, had Kansas City lime pay at 2,094 feet, was bottomed at 2,802 feet and plugged back to 2,112 feet. It was acidized two times and completed as a 35-bbl. oil well, with 30 bbls. of water daily.

Maralyn Oil Co. No. 1 Ralston, C SE SE section 8-28-4, was moving in material.

Marion County

Johnson No. 1 Metz, SW cor. section 24-17-4, Marion County, was abandoned at 350 feet.

Woodson County

Aikman & Braden No. 2 Arnold, CEL W half NE section 35-23-14, Woodson County, topped Mississippi lime at 1,639 feet and was bottomed at 1,645 feet. It was acidized, pumped 20 bbls. of oil daily and was completed.

Chris Sheedy and others No. 7 Yipton, SW NE NW section 28-25-14, was a location. Shell Petroleum Corp. and others No. 1 Murphy, NE cor. section 30-25-14, was a location. Union Oil & Royalty Co. No. 1 Laidlow, E half NW SW section 35-25-15, was drilling below 1,200 feet.

Stevens County

Stevens County Oil & Gas Co. No. 1 Spikes, C NE SW section 21-31-38w, Hugoton district, Stevens County, was acidized, produced 10,000,000 feet of gas and completed at 2,800 feet, total depth.

Panhandle Eastern Pipe Line Co. No. 1 Armstrong, C NE section 25-32-39w, was bottomed at 2,753 feet and produced 13,000,000 feet of gas daily.

Southwest Texas Fields

(Continued from Page 112)

company's first test, a small well completed several weeks ago.

Along the Balcones Fault line in Bexar County, Culver & Bender No. 1 Peterson is shutdown after bail-

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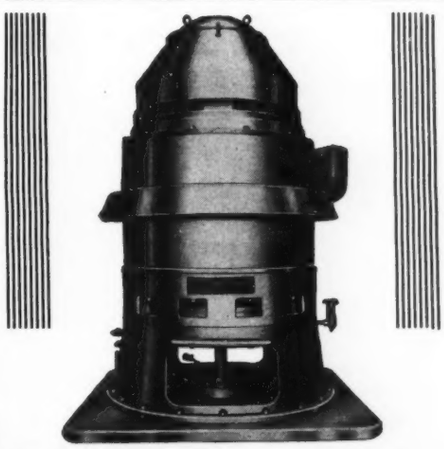

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Branch Offices: New York, Chicago, Los Angeles, San Francisco

POMONA TURBINE PUMPS

ing a small amount of oil sand. Shale was cored at 924-70 feet with a showing of oil in the lower section. Seven-inch casing was cemented at 904 feet. Location is 5 miles southwest of MacDona.

COMPLETED WELLS

Completed wells in proven Southwest Texas fields, with their total depth and the initial 24-hour production of the producing wells, were as follows:

Caldwell County

Branyon field: H. W. Compton No. 1 Johnson, 2,808 feet, 97 bbls., pumping. Dale field: Ralph Ogden No. 1-C Dinges, 2,415 feet, abandoned. Luling field: Taylor Refining Co. No. 1 Dorn, 2,106 feet, 35 bbls. of oil, 200 bbls. sulfur water, pumping.

Duval County

Benavides field: Benedum & Trees No. 11 Puig, 4,783 feet, 140 bbls., 5/32-inch choke. Burton Drilling Co. No. 2 Southland Life Insurance Co., 5,600 feet, abandoned. Hiawatha Oil & Gas Co. No. 8 Parr, 4,766 feet, 158 bbls., 5/32-inch choke. Republic Production Co. No. 5 Buoy, 4,786 feet, 86 bbls., one-eighth inch choke. Woodley Petroleum Co. No. 2 West, 5,369 feet, 231 bbls., quarter-inch choke. Hoffman field: Cox & Hamon No. 4 Hoffman-Conway, 2,760 feet, 30 bbls., jetting. Labbe field: Magnolia Petroleum Co. No. 14 Labbe, abandoned. Lundell field: Government Wells Oil Co. No. 17 Lundell, 1,512 feet, 4 bbls. per hour, quarter-inch choke. Piedra De Lumbre, oil sand 2,034-50 feet, 83 bbls., three-eighths inch choke. Seven Sisters field: A. J. Bloack No. 1 Garza, oil sand 2,645-55 feet, 110 bbls., quarter-inch choke.

Guadalupe County

Darst Creek field: Diamond Half Oil Co. No. 2 E. Miller, 2,615 feet, 57 bbls. oil, 2 per cent sulfur water, pumping.

McMullen County

Ezzell field: E. M. Jones No. 6-B Ezzell, 1,482 feet, 85 bbls., pumping; No. 3-F Ezzell, 1,543 feet, 29 bbls., pumping. Parr & Delaney Oil Co. No. 7 Hill, 1,532 feet, 175 bbls., quarter-inch choke; No. 8 Hill, 1,522 feet, perforated casing 1,495-1,505 feet, 75 bbls., pumping. Powell & Burnett No. 2 O'Connor, 1,514 feet, 20 bbls., pumping.

Kleberg County

Kingsville field: Mathews Oil Co. No. 1 Kevlin, 2,607 feet, abandoned.

Medina County

Chacon Lake field: Charles Wagner No. 19-A Medina Irrigation Farms, 226 feet, 3 bbls., air lift; No. 18-A Medina Irrigation Farms, 246 feet, 1 bbl., air lift; No. 17-A Medina Irrigation Farms, 234 feet, 1 bbl., air lift; No. 6-A Medina Irrigation Farms, 219 feet, 1 bbl., air lift; No. 5-A Medina Irrigation Farms, 216 feet, 1½ bbls. per day, air lift.

Nueces County

Flour Bluff field: Magnolia Petroleum Co. No. 1 Eagle Lake Improvement Co., 6,745 feet, abandoned. Saxet field: Western Gulf Petroleum Co. No. 6 Isensee, 5,026 feet, 71 bbls. in 12 hours, 9/64-inch choke. Barnsdall Oil Co. No. 8 Morgan-Clark, 6,718 feet, 140 bbls., three-sixteenths inch choke. A. R. Temple No. 1 Winger, 6,757 feet, abandoned. West Saxet: Renwar Oil Co. No. 2 McKinzie, 5,830 feet, perforated casing 5,814-18 feet, 180 bbls., one-eighth inch choke. Rutherford Oil Corp. No. 1 Stewart, 7,224 feet, abandoned.

Webb County

Killam field: O. W. Killam No. 36 Garcia, 2,575 feet, plugged back 1,992 feet, 60 bbls., pumping. Oilton field: Cox & Hamon No. 5 Wise, 2,002 feet, 36 bbls., quarter-inch choke. J. M. Singleton No. 1 Nunez, oil sand 1,903-12 feet, 150 bbls., pumping. Windsor Oil Co. No. 1 M. C. Landrick, 1,947 feet, 115 bbls., pumping.

Refugio County

Tomoconnor field: Quintana Petroleum Co. No. 6 Reilly, 5,976 feet, perforated casing 5,510-16 feet, 867 bbls., one-eighth inch choke. Quintana Petroleum Co. No. 15 Heard, 5,977 feet, perforated casing 5,849-55 feet, 1,560 bbls., quarter-inch choke. Hewitt & Dougherty No. 66 Lambert, 5,947 feet, perforated casing 5,843-56 feet, 525 bbls., quarter-inch choke. T. & N. Development Co. No. 1 Lambert, 7,014 feet, abandoned. South Oil Corp. No. 1-A Ryalls Estate, 6,778 feet, 188 bbls., 5/32-inch choke. Fred Shields No. 3 Ryalls, 6,801 feet, abandoned. Houston Oil Co. No. 23 Heard, 4,925 feet, 73 bbls., 5/32-inch choke.

Zapata County

Escobas field: Dunlup Oil Co. No. 33 Trevino, 1,209 feet, 10 bbls., pumping.

East Texas Fields

(Continued from Page 118)

feet, 65 bbls. Shell Petroleum Corp. No. 25-B Brooks, 3,655-3,687 feet, 30 bbls.; No. 26-B Brooks, 3,657-3,713 feet, 45 bbls. Tide Water No. 25-B Pinkston, 3,746-3,770 feet, 60 bbls.

Upshur County—Longview Area

A. Baggett No. 5 H. B. Owens, 3,735-36 feet, 50 bbls.; No. 6 H. B. Owens, 3,733-34 feet, 30 bbls. Humble Oil & Refining Co. No. 23 Johnson, 3,672-74 feet, 60 bbls. Red Iron Drilling Co. No. 3 Phillips, 3,635-40 feet, 30 bbls.

NORTH TEXAS COMPLETIONS

Archer County

Gem Oil Co. No. 1 W. P. Ferguson, 3,800-71 feet, 500 bbls. B. H. Hilburn No. 1 Right of Way, 1,783-90 feet, 15 bbls.

Cooke County

Kingery Brothers No. 5 Alice Johnson, 1,225-38 feet, 100 bbls. Mudge Oil Co. No. 22 Alice Johnson, 1,216-32 feet, 175 bbls. Pace Petroleum Co. No. 6 J. R. Winstead B, 1,170-92 feet, 100 bbls. A. D. Robinson No. 12 J. H. Otto A, 820-94 feet, 15 bbls.

Jack County

Royal Petroleum Co. No. 1 Jones C, 3,110-3,236 feet, 100 bbls.

Montague County

Continental Oil Co. No. 33 J. W. Maddox A, 905-20 feet, 10 bbls. Seitz & Comegys No. 1 J. W. King, 1,748-56 feet, 350 bbls.

Wichita County

L. T. Burns No. 25 First National Co., 3,600-30 feet, 1,600 bbls. Christie Hickman No. 3 W. P. Lowry, 3,730-3,816 feet, 560 bbls.; No. 4 W. P. Lowry, 3,638-3,816 feet, 560 bbls. R. R. Clark No. 43 Bickley, 892 feet, dry. C. W. Clark and others No. 1 First National Co., 3,689-3,882 feet, 510 bbls. Deep Oil Development Co. No. 6 First National Co., 3,626-3,842 feet, 640 bbls. Fain-McGaha Oil Corp. No. 2 Fain and others, 3,770-3,826 feet, 840 bbls. G. E. Grininger No. 1 T. J. Pace and others, 3,688-3,875 feet, 640 bbls. C. G. Hart No. 1 Allen Krohn, 2,026 feet, dry. Humble Oil & Refining Co. No. 13 First National Co., 3,613-3,860 feet, 800 bbls. flowing; No. 1 Lula Susan Pace, 3,694-3,860 feet, 400 bbls. Kadane, Inc. No. 1 J. A. Kemp B, 3,655-3,740 feet, 960 bbls. King Oil Co. and others No. 4 Mrs. Anna Mangold, 3,660-3,726 feet, 824 bbls. Lewis Production Co. No. 3 Wichita National Bank, 3,689-3,761 feet, 600 bbls. Tom B. Medders and others No. 1 Mrs. Edith Fields, 4,510 feet, dry. Mul-Berry Oil Co. No. 1 R. J. Bradley, 3,665-3,813 feet, 1,920 bbls. Perkins & Cullum No. 13 S. B. Burnett and others A, 1,517-29 feet, 72 bbls. Pois & Schulz No. 6 Foster & Allen C, 1,264-75 feet, 15 bbls. Rubsam & Hunter No. 20 McClure B, 580-89 feet, 10 bbls. J. B. Stoddard No. 1 Sue Mitchell, 3,900-54 feet, 320 bbls. E. J. Stump and others No. 1 Mary Putnam Bishop, 4,043 feet, dry. Wilson-Ligon-Burns No. 3 Munger, 3,786-3,875 feet, 1,050 bbls.

Wilbarger County

Phillips Petroleum Co. No. 6 W. T. Waggoner, 2,523-32 feet, 110 bbls.

Young County

P. Atchley No. 10 Benson, 925-47 feet, 20 bbls. C. E. Beavers and others No. 3 Cooper, 1,196 feet, dry. L. T. Burns No. 1 M. Foehr A, 960-75 feet, 20 bbls. T. D. Humphrey No. 2 J. K. Jeffery, 3,842-4,175 feet, 65 bbls. W. J. Rhodes No. 6 A. Burkett, 3,968 feet, dry. Sams & Watson No. 4 F. M. Cullers, 593 feet, dry. D. L. Wolf No. 4 J. M. Wilson, 1,124 feet, dry.

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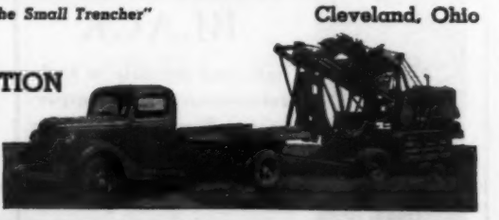

CLEVELANDS

West, Central and Panhandle Texas

By MITCHELL TUCKER

Andrews County's New Pool; Bohago Outpost Disappoints

FORT WORTH, Tex., Mar. 14.—A new producing field in Andrews County, 6 miles northwest of the Fuhrman pool, is indicated through favorable small heads of new oil being swabbed from Seaboard Oil Corp. No. 1 Munger and Nix. At a total depth of 4,526 feet the well has been stage-treated with 1,000, 3,000 and 6,000 gallons of acid. As yet it has failed to flow, but considerable new formation oil has been recovered by swabbing, as indicated by differences in gravity between that produced (27.8) and the oil used for acid load (25). Production averaged 5 bbls. hourly by swabbing following the 3,000-gallon treatment. The well has not taken full penetration in the lime as yet, and it will probably be deepened for additional testing.

Rogers & Rogers No. 1 O. B. Holt, Jr., wildcat in southern Andrews County, about 10 miles north of the North Cowden field, is being closely watched while in the testing stage. After being shot with 60 quarts at 4,528-41 feet, total depth, some salt water is appearing. It is thought to be coming from a separated porous zone above the reported showings of oil. The Beckman process for drilling in is being used while testing.

Gulf Oil Corp.'s two possible extensions to the Slaughter field of southern Hockley County remain highlights of interest. No. 1 M. G. Gordon, 1 mile southeast of production in the five-well field, is drilling at 4,968 feet and reporting a showing of gas. Gulf No. 1 Mallett, 2 miles southwest of production, drills ahead at 4,798 feet.

Honolulu Oil Corp., Ltd., No. 1-51 Slaughter, new completion in the field, made an initial gauge of 250 bbls. daily. The formation will be given its first acid treatment in order to increase the flow.

The Bohago one-well producing area in southeastern Yoakum County received disappointments last week. Ohio Oil Co. No. 1 Clawater, 1 mile southwest of the discovery well, is swabbing only sulfur water at a total depth of 5,353 feet after several acid treatments.

Gulf Oil Corp. No. 1 Dixon, wildcat well about midway between the Bennett field and the Bohago area in southeastern Yoakum County, has acidized in order to provide a more thorough test of a saturated section logged at 5,271-5,371 feet. The well had been shot with 400 quarts, and bailed 3 gallons of fluid hourly, one half oil and one half water.

In the Bennett field proper, Honolulu-Cascade and Devonian companies jointly, discovers of the field, added the fourteenth producer to the field in their No. 2-678 Bennett, flowing 564 bbls. daily on initial gauge through 2-inch tubing. The hole was shot with 485 quarts from 5,150 to 5,270 feet.

Pushing the fast expanding producing limits of the Wasson field further southeast, Shell Petroleum Corp. No. 1-C Baumgart, 1¼-mile extension, gauged 435 bbls. of oil with 744,000 feet of gas through 2-inch tubing, following a 600-quart shot and a 5,000-gallon acid charge from 4,810 to 5,018 feet, total depth.

Crane County Ordovician

Gulf Oil Corp. No. 7 Waddell, south offset to the 7,173-bbl. producer in the flush Ordovician producing area of western Crane County, is setting pipe at 5,881 feet in preparation to drill the Simpson and test. This hole is reported to be running slightly lower than No. 5 Waddell, the field's record producer. Four oil wells have been completed in the Ordovician level. Several dry holes have been drilled in the immediate vicinity of production without defining the structural trend.

Crockett County

Pitzer & West of Breckenridge, prominent producers in the West Central Texas district, have purchased the holdings of J. N. Simpson in the Hoover Ranch field of western Crockett County. The pool was opened in 1930 but development has been slow due to a lack of pipe line outlet. At this time two small wells have been drilled, neither of which was fully completed. They have not been produced. Recently the discovery well was reentered and deepened from 2,038 to 2,064 feet and shot with 210 quarts, gauging 51 bbls. in 24 hours by pumping. Pitzer & West are making location for the immediate drilling of a south offset, and four other wells are being started by nearby lease holders. Additional storage is being built to temporarily care for production.

McCamey Field—Upton County

Inside drilling continues in the old McCamey field of southern Upton County. A total of 128 wells were completed there last year. Best of the recent completions was recorded last week by George F. Getty, Inc., No. 1 J. H. Shirk, section 15, Block 3, M.K.&T. Survey, which pumped 1,150 bbls. of oil in 24 hours after a 4,000-gallon acid charge in pay at 2,640-80 feet, total depth.

Quarterly Gas-Oil Ratio Surveys

A railroad commission order was issued last week calling for quarterly gas-oil ratio surveys in all fields of Western Texas. This is the first action taken by the commission following the formal hearing held on February 7 regarding proper field ratios. The order as issued read that each operator of wells in 12 counties having a gas-oil ratio in excess of 2,000 feet to the barrel of oil produced, shall make a ratio test of his wells according to the procedure prescribed by the commission, and file results immediately. The gas-oil ratio factor enters into the allocation formula of many of the West Texas fields, and at present an active remedial campaign is underway to reduce the ratios.

Wildcats

Humble Oil & Refining Co. No. 1 Lewis and Wardlow, a wildcat in western Tom Green County, near Tankersley, with production in beds of Ordovician age as its objective, continues to drill below 7,050 feet in lime and chert.

Bryson Oil & Gas Co. of San Angelo has acquired operating interest in the Tex Tor Oil Corp. No. 1 Judkins and Spencer, eastern Schleicher County wildcat. At present the well is exploring the Ellenburger (Lower Ordovician) below 6,210 feet, without having reported favorable showings of oil.

WEST CENTRAL TEXAS

Completion of Hal Hughes and others No. 1 Poindexter, southwestern Callahan County discovery near Oplin was the largest Ordovician producer in the West Central Texas district the past week. After a 3,000- and 7,000-gallon acid treatment in lime from 4,368-89 feet, the well flowed naturally through 2-inch tubing and three-quarter inch choke against 125 pounds back pressure on separator, and gauged 896 bbls. in nine hours according to official railroad commission test, or at the rate of approximately 2,400 bbls. daily. Hughes and associates are now standardizing and preparing to drill in No. 1 Johnson 3 miles to the southeast of this discovery, and expect it to prove the extension of the producing area in that direction. Present total depth of the Johnson test is 3,903 feet. Superior Oil Corp. of Tulsa, Phillips Petroleum Co. and Amerada Petroleum Corp. are nearby acreage holders, and are considering test wells in the Oplin district.

In the Avoca field of northeastern Jones County, Humble Oil & Refining Co. and Iron Mountain Oil Co.'s west extension, No. 4 Jones and Stasney, flowed 1,636 bbls. in 14 hours from Palo Pinto lime at 3,187-3,207 feet, extending producing limits one location in that direction.

Showing for a small producer in the third pay horizon of the Ivy pool in northwestern Shackelford County, Owens-Snebold No. 4 Ivy is drilling ahead after testing 25 to 30 bbls. daily in the Bluff Creek sand from 1,619-24 feet. This well is offset to the south by a 1,930-foot oil well and to the southwest by a 3,200-foot Palo Pinto lime producer, so will be carried to the lower producing zone for completion.

Superior Oil Corp. plugged its No. 1 Hendrick which was considered to be located on the Avoca pool's northeast trend play into southeastern Haskell County. After logging Palo Pinto lime low at 3,214 feet, drilling was continued to a total depth of 3,254 feet before abandonment. Humble Oil & Refining Co.'s Palo Pinto test in Throckmorton County is drilling in the Palo Pinto lime below 3,098 feet without showings.

March 21 has been set as the date for a spacing hearing before the railroad commission for the new southern Jones County Centerline field discovered by Walter K. Jones of Oklahoma City. The field opener, No. 1 Ora Neas, flowed 322 bbls. in 16 hours on initial gauge.

PANHANDLE

Twelve new completions and 12 new locations comprised the activity in the Panhandle district last week. Of the completions, two were for gas and 10 for oil; new oil potential totaled 4,559 bbls. daily, and new potential gas flow gauged 28,000,000 feet.

An attempted extension of the producing area southeastward into Collingsworth County was unsuccessful. Wischkaemper and Knoll No. 1 Wischkaemper, section 58, Block 16, H.&G.N. Survey, reported small showings of gas at 1,840, 1,870, 1,950-70 and 2,130 feet, and small showings of oil at 2,157 feet. Water was found from 2,870 to total depth of 2,880 feet, where the hole was abandoned.

WEST TEXAS COMPLETIONS

(24-hour gauges)

Andrews County

Sinclair Prairie No. 1 J. W. Gowen, 4,266-4,459 feet, 40 bbls. J. W. Trippiehorn No. 3 King, abandoned location.

Crane County

Big Basin Petroleum Co. No. 1 Cowden, dry and abandoned at 3,473 feet. Continental Oil Co. No. 5-C Hughes, 2,270-90 feet, 615 bbls. Gulf Oil Corp. No. 3 McKnight, 3,530-3,650 feet, 159 bbls. Texas Co. No. 2-A University, 3,495-3,585 feet, 436 bbls.

Culberson County

Jarrell-Bell-Harrison No. 1 Caldwell, abandoned location.

Fisher County

Magnolia Petroleum Co. No. 1 J. Howard, 3,480-3,503 feet, 292 bbls.

Ector County

Atlantic No. 1-B University, 3,390-3,600 feet, 309 bbls. Barnsdall No. 4 E. F. Cowden, 4,055-4,170 feet, 1,547 bbls.; No. 9 F. Foster, 4,020-4,185 feet, 1,120 bbls. Continental Oil Co. No. 1 T. & P. Land Trust, 4,040-4,230 feet, 1,064 bbls.; No. B-35-6 Rumsey, 4,200-65 feet, 734 bbls. Gulf Oil Corp. No. 73 Goldsmith, 4,150-95 feet, 1,796 bbls.; No. 74 Goldsmith, 4,155-4,210 feet, 1,600 bbls.; No. 76 Goldsmith, 4,150-4,210 feet, 480 bbls.; No. 77 Goldsmith, 4,149-95 feet, 644 bbls. Honolulu & Black No. 1-C Cowden, 3,970-4,220 feet, 322 bbls. Rushwold Oil Co. No. 1-B Connell, 3,410-3,650 feet, 472 bbls. Shell Petroleum Corp. No. 7-B Cowden, 4,080-4,230 feet, 767

bbls. Texon Oil & Land Co. No. 1 Midland National Bank, 4,165-4,340 feet, 923 bbls. Wentz Oil Co. No. 1-B Parker, 4,129-4,210 feet, 321 bbls.; No. 2-D Parker, 4,076-4,259 feet, 585 bbls.

Howard County

Plymouth Oil Co. No. 15 Kloh, 2,456-2,510 feet, 733 bbls. Shasta Oil Co. No. 2-A Texas Land & Mortgage Co., 2,676-2,871 feet, 1,497 bbls.

Irion County

Pearson & Alexander No. 7 Nutt, dry and abandoned at 1,585 feet.

Lamb County

Toddie L. Wynne, Trustee No. 1 Neuenschwander, dry and abandoned at 5,503 feet.

Pecos County

Cardinal Oil Co. No. 1-O Tippett, 1,372-80 feet, 48 bbls. J. J. Dorr and others No. 2 Payton, 1,988-2,050 feet, 93 bbls. Hoss & Downey No. 2 Cardz, abandoned location.

Scurry County

T. G. Shaw No. 1 First National Bank, junked hole at 3,369 feet.

Upton County

Blaine Oil Co. No. 4 Powell, 2,455-62 feet, 1,067 bbls. Pure Oil Co. No. 9 Hughes, 2,475-2,611 feet, 257 bbls.

Yoakum County

Humble Oil & Refining Co. No. 1 Abilene State Bank, 4,856-5,005 feet, 328 bbls. Shell Petroleum Corp. No. 1-C Baumgart, 4,836-5,018 feet, 435 bbls. Texas Pacific Coal & Oil Co. No. 5 Bennett, 5,085-5,278 feet, 1,460 bbls. Toddie L. Wynne, Trustee No. 1 Fairman, 4,960-5,070 feet, 261 bbls.

Winkler County

Gulf Oil Corp. No. 29 O. Clapp, abandoned location. Humble Oil & Refining Co. No. 28-A Colby, 2,780-3,000 feet, 363 bbls. Magnolia Petroleum Co. No. 134 Walton, 2,829-2,913 feet, 54 bbls.; No. 135 Walton, 2,832-2,922 feet, 844 bbls.; No. 136 Walton, 2,813-2,951 feet, 951 bbls.; No. 137 Walton, 2,842-2,954 feet, 1,647 bbls. Texas Pacific Coal & Oil Co. No. 2 Baird, 3,010-75 feet, 1,059 bbls.

Ward County

Gulf Oil Corp. No. 77 Estes, 2,462-2,690 feet, 662 bbls.; No. 81 Estes, 2,620-83 feet, 1,367 bbls.

WEST CENTRAL TEXAS COMPLETIONS

Throckmorton County

C. H. Deaner No. 1 Wilkinson Estate, dry at 535 feet. Jack Rankin No. 1 J. L. Tuggle, dry at 507 feet.

Shackelford County

Hugh King, Jr., and others No. 1 Davis-Walker, dry at 3,965 feet. Roeser & Pendleton No. 1 Dawson-Conway, pumped 115 bbls. after 50-quart shot at 1,603-17 feet, total depth 1,625 feet. Grady Bailey No. 3 A. Andrews, 8 bbls. daily at 521-33 feet.

Jones County

Iron Mountain and Humble No. 4 Jones, Stasney & Bowden, flowed 1,636 bbls. in 14 hours 45 minutes from 3,189-3,207 feet, total depth. Thomas D. Humphrey No. 1 Dorsey, deepened from 2,061 feet to 2,733 feet, total depth, dry.

Callahan County

Hal Hughes and others No. 1 Poindexter, flowed 896 bbls. in nine hours after two-stage acidization of 10,000 gallons at 4,369-89 feet, total depth. Estimated 5,000,000 feet gas per day. Marie Johnson No. 5 L. Williams, dry at 398 feet, total depth.

Haskell County

Superior Oil Corp. No. 1 Hendrick, dry at 3,254 feet, total depth.

Fisher County

Magnolia Petroleum No. 1 Joe Howard, pumped 294 bbls. daily from 3,487 to 3,503 feet, total depth.

PANHANDLE COMPLETIONS

(24-hour gauges)

Carson County

Gulf Oil Corp. No. 12 Block, 3,020-3,142 feet, 434 bbls. Magnolia Petroleum Co. No. 36 fee, 2,920-25 feet, 274 bbls.

Collingsworth County

Wischkaemper & Knoll No. 1 Wischkaemper, dry and abandoned at 2,880 feet.

Gray County

Kewanee Oil & Gas Co. No. 14 Morse A, 2,393-2,483 feet, 271 bbls. Southern Petroleum Corp. No. 11 Vaughn, 3,130-3,225 feet, 777 bbls. Texas Co. No. 7 Barett, 3,108-55 feet, 382 bbls.

Hutchinson County

Drilling & Exploration Co. No. 16 Haile, 3,035-80 feet, 327 bbls. Phillips Petroleum Co. No. 4 Gary, 3,240-72 feet, 328 bbls. Kewanee Oil & Gas Co. No. 34 Lewis, 2,930-3,011 feet, 547 bbls. Midstates Oil Co. No. 17 Whittenburg A, 2,917-66 feet, 705 bbls. Dave Rubin No. 4 Barnhill, temporarily abandoned. Texas Co. No. 8 Quinn, 3,012-95 feet, 500 bbls.

Wheeler County

Lone Star Gas Co. No. 1 Lane, 1,828-1,970 feet, 27,800,000 feet of gas. Magic City Oil Co. No. 5 Koons, 2,350-77 feet, 14 bbls.

Gulf Coast Fields

(Continued from Page 120)

acquired a one-acre lease near the well, paying $5,000 for the acre. These leases require wells to be started within 60 days.

A second producer for the 8,000-foot horizon in the Lafitte field, Jefferson Parish, was completed, Texas Co. No. 4 Lafitte. Originally completed at a total depth of 10,092 feet, production was obtained by perforating the casing at 8,035-90 feet. It had an initial flow of 1,495 bbls. of 33-gravity oil per day through a quarter-inch choke.

In the Villa Platte field, Evangeline Parish, Continental Oil Co. had three wells nearing critical depths. No. 1 Hirsch, in section 44-3s-2e, topped the Cockfield at 7,830 feet, and is drilling the Vicksburg at 7,046 feet and is drilling in shale and lime below 7,700 feet. No. 1 Tate, located in the same section and offsetting the discovery well, is drilling in shale and lime at 7,769 feet.

In the Lake Hermitage field, Gulf Oil Corp. No. 7 Lafourche in section 12-18s-15e opened a deeper sand when it flowed 5 bbls. of distillate per day through a one-eighth inch choke with tubing pressure 1,040 pounds. The gas will be used as fuel for further development of the field.

COMPLETIONS ON TEXAS COAST

Completions of the week with pay sand recorded or total depth, and initial 24-hour production follow:

Brazoria County

Hastings field: Humble Oil & Refining Co. No. 10 R. D. Haden, 6,095 feet, 283 bbls., quarter-inch choke; No. 8 W. G. McDeed, 6,080 feet, 609 bbls., quarter-inch choke; No. 6 W. H. Schindler, 6,080 feet, 675 bbls., quarter-inch choke. Pearland Oil Co. No. 3 C. H. Alexander, 6,097 feet, perforated casing 6,083-97 feet, 629 bbls., quarter-inch choke. Stanolind Oil & Gas Co. No. 7 R. L. Autrey, 6,080 feet, perforated casing 6,052-77½ feet, 569 bbls., quarter-inch choke. Stanolind Oil & Gas Co. No. 16 L. D. Shaw, 6,080 feet, perforated casing 6,045-77 feet, 588 bbls., quarter-inch choke; No. 2 D. Sheffield, 5,430 feet, perforated casing 527 bbls., quarter-inch choke; No. 3 H. M. Shyrock, 6,080 feet, perforated casing 6,032-44 feet, 556 bbls., quarter-inch choke. Lockridge field: Gulf Oil Corp. No. 3-A Wood, 6,368 feet, perforated casing 6,363-66½ feet, 219 bbls., 23 hours, 5/32-inch choke. West Columbia field: Sterling Oil & Refining Co. No. 1 Powers and others, 5,912 feet, 512 bbls., quarter-inch choke.

Chambers County

Barbers Hill field: Atlantic Refining Co. No. 1 A. M. Fisher, 5,608 feet, 453 bbls., quarter-inch choke. Cedar Bayou field: Merit Oil Co. No. 1 M. C. Winfree, 6,670 feet, abandoned.

Harris County

Friendswood field: H. C. Cockburn No. 1 fee, 6,315 feet, abandoned. Tomball field: Humble Oil & Refining Co. No. 2 Tallman, 5,630 feet, perforated casing 5,581-5,615 feet, 1,935,000 feet of gas, quarter-inch choke. Shell Petroleum Corp. No. 1-B Tyson, 5,566 feet, perforated casing 5,560-63 feet, 602 bbls., quarter-inch choke.

Jefferson County

Nome field: Humble Oil & Refining Co. No. 1-A Willis, 6,500 feet, abandoned. Shell Petroleum Corp. No. 7 Carpenter, 6,034 feet, 706 bbls., quarter-inch choke.

Liberty County

Hardin field: Atlantic Refining Co. No. 1 J. V. Cessna, 7,610 feet, perforated casing 7,596-7,604 feet, 330 bbls., quarter-inch choke.

Newton County

Call field: Houston Oil Co. and Republic Production Co. No. 3 Sabine Tram, 7,122 feet, abandoned.

Polk County

Segno field: Gulf Oil Corp. No. 10 Wing, 5,260 feet, 54 bbls. in four hours, quarter-inch choke.

Wharton County

Magnet field: Humble Oil & Refining Co. No. 7 H. C. Cockburn, 5,543 feet, 88½ bbls., one-eighth inch choke.

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Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, Mar. 12.—Crude oil and naphtha production from all Alberta fields in January established a new high with a daily average of 14,329 bbls. per day, or a total of 444,196 bbls., compared with 394,893 bbls. in December and 127,977 bbls. in January, 1937. Of the January total, 440,974 bbls. came from Turner Valley, where wells were prorated to 35 per cent of potential up to January 15 and thereafter 42 per cent.

Turner Valley Producers

On the Turner Valley west flank, Model-Spooner-Reward No. 1, LSD 4, section 28-18-2w5, after acidization increased its potential from 666 to 848 bbls., prorated at 356 bbls.

In section 32-18-2w5, Royalite Oil Co. No. 28, LSD 16, finished in the Madison limestone at 6,949 feet with natural potential around 450 to 500 bbls. a day was acidized, developing a potential around 800 bbls. West Flank Oil Co. No. 1, LSD 1, same section, finished in the Madison limestone at 6,827 feet with natural potential of 312 bbls. a day, is cleaning and testing after a shot of 600 quarts.

In section 20-18-2w5, Spy Hill Royalties No. 1, LSD 16, finished in the Madison at 7,058 feet, is cleaning out after a shot of 600 quarts.

Tests in the Lime

Two more west flank tests have entered the Madison limestone. In section 29-18-2w5, Davies Petroleums No. 1, LSD 2, got the lime at 6,898 feet and is deepening after cementing production string at 6,908 feet. Sunburst Oil Co. No. 1, N half LSD 1, same section, got the Madison at 6,705 feet and has cemented 6⅝-inch casing in the top of the lime. Contracts have been let for a separator and three 1,000-bbl. tanks.

In section 28-18-2w5, Richland Royalties No. 2, LSD 12, which got the Madison limestone some weeks ago at 6,410 feet has resumed from 6,858 feet. It has a fair crude flow and commercial production is expected around 6,920 feet.

West Side Drilling

In section 32-18-2w5, Davies Petroleums No. 4 has been located by Russell V. Johnson, geologist, in center LSD 10, same section, and will be rigged as soon as cable tool equipment from Davies No. 3 is available. West Turner Petroleums No. 1, LSD 2, is below 6,177 feet. West Turner No. 2, LSD 7, is fishing at 1,440 feet.

In section 29-18-2w5, Commoil No. 2, LSD 10, offsetting Royalite No. 31 and Globe Royalties No. 1, has let contract to Snyder & Head and will start drilling early in April. Royalite Oil Co. No. 31, LSD 6, is spudding.

In section 20-18-2w5, Consolidated Royalties No. 1, LSD 14, is below 1,781 feet. Intercity Royalties No. 1, LSD 11, is below 1,318 feet. Sunset Oils No. 2, LSD 7, is below 633 feet after setting surface pipe.

In section 16-18-2w5, Frontier Royalties No. 1, LSD 11, is below 2,401 feet. Royal Canadian Oil Co. No. 2, LSD 4, has spudded. Okalta Oil Co. No. 7, LSD 3, is below 965 feet. Okalta No. 8, LSD 6, is below 530 feet.

In section 9-18-2w5, National Petroleum Corp. No. 2, LSD 14, is below 6,255 feet.

In section 33-17-2w5, Davies Petroleums No. 3, LSD 7, is deepening in the Belly River formation after running 13⅜-inch casing to 1,338 feet.

North Turner Valley

In North Turner Valley, Royalite Oil Co. No. 29 Turner Basin, LSD 7, section 27-20-3w5, is below 6,708 feet in a hard formation of the Madison limestone which was contacted at 6,275 feet. The limestone has been a succession of hard bands with very little porosity indicated.

To Complete Phillips Well

On the North Turner Valley west flank, Phillips Royalties No. 1, LSD 16, section 16-20-3w5, will be completed from 3,735 feet with rotary outfit. Drilling contract has been let to W. F. Farres. The test is about a mile southwest of Model Oils No. 1 crude producer. Completion is being financed as the result of arrangements with Home Oil Co. whereby the latter takes an option on 1,600 acres close to its Millarville holdings for $80,000 and advances $25,000 additional for deepening Phillips No. 1 to 7,000 feet if necessary. Home Oil Co. is to be repaid the $25,000 from 25 per cent of the first production of No. 1 well, with a continuing royalty of 10 per cent for the life of the well.

Turner Valley Output

Alberta government figures show the 1937 crude oil and naphtha outfit from all fields in the province had a value of $4,913,960 compared with $2,915,442 in 1936. The 1937 increase was in spite of reduced prices and drastic proration.

East Side Drilling

On the Calling Valley structure, east of Turner Valley, Sentinel Oil Co. No. 1, LSD 1, section 8-20-2w5, is standing at 6,750 feet.

On the Aldersyde structure, Ranchmen's Oil Co. No. 1, LSD 16, section 13-20-29w4, bottoming in the Upper Dalhousie formation at 7,230 feet, has resumed fishing for 140 feet of lost cable. Anglo-Canadian Development & Holding Co. of Calgary is completing the well.

Crude Show in Highwood

On the Highwood-Sinclair structure, southwest of Turner Valley, Green Valley Oils No. 1 Banner, LSD 6, section 34-17-3w5, got the Madison limestone at 5,360 feet and is at 5,796 feet, with some crude. It has been standing with a set of jars broken in the hole. The oil is different from the Turner Valley product, and apparently comes from the bottom of the hole.

All's well! - with this Well. The verdict of an expert:

We have pleasure in confirming our entire satisfaction with the rotary drilling plant supplied by you . . . . . .

The attendance of the plant has been enormously simplified by the arrangement provided by you . .

The stepless regulation of the speed permits of a better adaptation to the rock formation.

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Rotary Plants for deep well drilling

Agents for U.S.A.:

Seamless Steel Corporation

New York, Broadway 39

Central West Fields

(Continued from Page 125)

Co. No. 1 H. J. Young, section 17, was abandoned. The Clinton sand was dry at 2,974-94 feet.

In Morgan County, Marion Township, Penn Contracting Co. No. 1 Frank Dawson, section 30, was good for 125,000 feet of gas per day from the second Berea sand at 1,547 feet.

Lima Field

The joint test of the Sun Oil Co. and the Tiffin Co., 1 mile north of Tiffin in Seneca County, Clinton Township, section 7, on the A. M. Clouse tract, filled 1,350 feet with oil in 10 days from the Green sand at 2,053-55 feet. Forty barrels of oil were pumped off the first day after equipment was installed. The following day, 5 bbls. were pumped off. The operators plan to acidize the well. The oil has a gravity of 43 degrees with .48 per cent sulfur, while the oil from the Trenton horizon in the immediate vicinity has a gravity of less than 41 degrees.

In Seneca County, Liberty Township, Forrest Oil Co. No. 1 Homer Martin, section 25, found the top of the Trenton at 1,338 feet, and is drilling 60 feet in with no showing as yet.

In Miami County, Green Township, Mid-West Development Co. No. 1 Archibald Peterson, section 19, pumped 1½ bbls. of oil from the basal part of the Trenton at 1,465 feet, the first 24 hours. The well was plugged back from the St. Peter sand which lies immediately below the Trenton.

EASTERN KENTUCKY

ASHLAND, Ky., Mar. 14.—Only one completion was reported in Eastern Kentucky in the past week and only an incomplete report on it was received in Ashland up to this writing. It is Inland Gas Corp. No. 196, on the Helen Leslie land, on Levisa Fork in Pike County. The production is not yet known here.

In Lee County, Petroleum Exploration is engaged in drilling No. 18 Pryse Heirs, in the Ida May district. Preparations are being made for a shot. The well filled up 250 feet with oil.

In Powell County, South Penn Oil Co. was drilling at 150 feet in No. 12 Adams & Lamberson, on South Fork in the South Fork district.

In Martin County, Kentucky-West Virginia Gas Co. reached the 1,400-foot level in sand in No. 5236, C. W. Preece land, on Coldwater Fork. The same firm was drilling 80 feet in slate in No. 5237, on the same land, and below 410 feet in No. 5238, also on the Preece land. The same company is grading location for No. 5239 on the C. W. Preece land on Peg Fork of Coldwater Fork.

In Floyd County, Kentucky-West Virginia Gas Co. is idle at No. 567, M. Slone and M. D. Slone, on Levisa Fork, and has reached 1,381 feet in No. 568, Samuel Dillion land, on Ivy Creek of Levisa Fork. The same firm was spudding No. 569, Jeff Jarvis land, on Home Branch of Buffalo Creek, and has reached 1,309 feet in No. 5233, John F. Burchett land, on Cow Creek.

In Knott County, Inland Gas Corp. is moving to location of No. 1 on the Maryland Beverly land, on Jones Fork in Knott County.

WESTERN KENTUCKY

OWENSBORO, Ky., Mar. 14.—Six oil wells averaging 28 bbls. per day initial production; 1 gas well and 4 dry holes, a total of 11 completions, was the record of the Western Kentucky fields in the past week.

In Breckinridge County, Tar Springs district, William Rollins and others No. 1 Acos Brothers, deep test, was drilling at 470 feet. Cloversport district: Flesher, Galey and others No. 4 Murray Tile Co., deep test, was drilling at 1,508 feet. Falls of Rough district: A. V. Smith and others No. 1 Garland Parton is a location.

In Butler County, Rochester district: Frank Bernier No. 2 Kyle Willis, was completed. It produced 20 bbls., natural flow from Jett sand at 812-25 feet the first 24 hours.

In Hancock County, Goering district: Cumberland Petroleum Co. No. 1 Clarence Dunleavy was drilling at 580 feet. Jones sand was dry. Easton district: William Ralston and others No. 5 Oat Smith is a 50,000-foot gasser from Jackson sand at 617-33 feet. It may be drilled to the Barlow sand. W. E. Hupp and others No. 2 Fred Richards was a dry hole through Jackson sand and was abandoned. Cloverport district: Flesher, Galey and others No. 1 J. H. Brown was spudding.

In McLean County, Island district: South Penn Oil Co. No. 3 Alma Nall was completed. It started at 75 bbls. from Jett sand at 1,445-67 feet; shot with 10 quarts at 1,447-65 feet; total depth was 1,468 feet. South Penn Oil Co. No. 4 H. K. and John Kirtley, deep test, was drilling at 1,750 feet. Buel district: J. C. Ellis No. 1 Weil Brothers was dry and abandoned in Brown lime at 1,710 feet. Livermore district: Kentucky Natural Gas Co. and others No. 2 Richard Shockley was a dry hole through Bethel sand at 1,125-41 feet. It had salt water at 1,138 feet; total depth 1,157 feet. It may be drilled deeper. Jack Cox and others No. 3 D. A. Bennett has material moved in. Maxwell district: J. C. Ellis No. 4 John Ditto heirs has material moving in.

In Muhlenberg County, Bremen district: Peerless Oil Co. No. 1 C. C. Gossett, deep test, was drilling at 500 feet. Paradise district: South Penn Oil Co. No. 2 Rogers-Crescent Coal Co., deep test, was fishing at 1,800 feet.

In Ohio County, Sunnydale district: Joe Lang and others No. 4 J. R. Camron is a 20-bbl. completion. Jett sand was shot with 90 quarts. Fordsville district: Snowden & McSweeney No. 23 J. W. Peckinpaugh started at 10 bbls. per day from Jett sand, shot with 60 quarts. Adaburg district: Nollem Oil & Gas Co. No. 4 Vincent Crowe was drilling at 240 feet. Rex-Pyramid Oil Co. No. 4 P. R. Wells was spudding in. Friendship Church district: A. D. Noe and others No. 6 A. S. Crawley, show of oil in Barlow sand at 729-43 feet. It was undecided whether to shoot or abandon. A. Teller and others No. 13 A. A. Whitehouse is a 20-bbl. completion in Barlow sand.

In Wayne County, 10 miles northwest of Monticello: J. T. Wilson No. 1 Twyford Heirs made 25 bbls. the first day from Lower Sunnybrook sand at 450-60 feet.

In Webster County, Sebree district: Powell, Koker and others No. 6 L. Allen was drilling at 500 feet.

North Louisiana Fields

(Continued from Page 117)

pressure of 125 pounds and casing pressure of 400 pounds. Total depth is 6,165 feet.

In Cass County, Texas, a wildcat drilling about 4 miles north of the producing area was abandoned after failing to show oil in the Glen Rose. The test, G. H. Vaughn No. 1 Riley, in the J. Taylor Survey, is bottomed at 6,290 feet.

Jefferson Schedule

The Jefferson-Lodi area of Marion County, Texas, was given a separate classification this month when the proration schedules were issued by the Texas Railroad Commission. Operators have been asking for a separate schedule from the Rodessa field, from which Jefferson is apparently separated by dry holes. The new schedule gives the area a total allowable production of 5,976 bbls., listing 49 producers.

Lisbon Completions

Lisbon gained two producers during the week; one each in the Claiborne and Lincoln Parish portions of the field. In Claiborne Parish, G. H. Vaughn brought in No. 3 King, making 65 bbls. per hour on a half-inch choke, with tubing pressure of 100 pounds and casing pressure of 250 pounds. The test was treated with 5,000 gallons of acid. Total depth is 5,133 feet.

In Lincoln Parish, Magnolia Petroleum Co. No. 1 Patton Heirs, made 85 bbls. in 12 hours on a quarter-inch choke, with tubing pressure of 120 pounds, casing pressure of 150 pounds, after acidizing with 3,000 gallons. Total depth is 5,398 feet.

In the Zwolle field of Sabine Parish, Major Oil Co. No. 1 Henry made 222 bbls. per day through open tubing, with casing pressure of 160 pounds. Total depth is 2,547 feet.

Cotton Valley

The Holloway sand in the Travis Peak at Cotton Valley continues to attract attention. In the past week, one test cored the thickest section yet reported in the sand, and others cored either no saturation or very thin sections. A. G. Oliphant No. 1 Central Investment Co. is being given a production test. Operators set 10⅝-inch casing at 5,851 feet, after topping the Travis Peak at 5,841 feet and coring Holloway sand at 5,862-91 feet. Total depth is 5,901 feet.

The Magnolia Petroleum Co. No. 1 Coyle-Tiner, section 21-21-10, topped the Travis Peak at 5,775 feet and cored sand at 5,832-35 feet which showed oil. The Holloway sand had such slight showing that the test is being drilled deeper to the Bodcaw sand.

The sole completion of the week in Cotton Valley was Ohio Oil Co. No. 48 Bodcaw Account 2, in section 15-21-10. The well made 378 bbls. of distillate in 14 hours, together with an estimated 4,000,000 feet of gas daily on a three-eighths inch choke. The tubing pressure on the gauge was 2,390 pounds and the casing pressure 3,250 pounds. Total depth of the well is 8,410 feet.

Buckner Activity

Further development of the Buckner field in Columbia County, South Arkansas, was delayed by a fishing job on Standard Oil Co. No. 1 Barbara-Bodcaw, which topped the anhydrite at 7,048 feet and is bottomed in Dolomite and green shale at 7,226 feet. Operators washed over and cut 19 joints of drill pipe, and were withdrawing the "fish" at latest reports. The second test in the Buckner area is the same company No. 1 Crone, which is coring in red shale and anhydrite below 7,195 feet.

Located 2½ miles east of Buckner, the Standard No. 1 Phillips in section 15-17-19 is drilling in shale with streaks of lime below 4,030 feet.

Oklahoma Fields

(Continued from Page 124)

pits; same operator's No. 79 Richards, SW NE SW NE section 6-4s-3w, location; Robert Swan No. 5-A Ratliff, NW NW SW section 28-1s-2w, drilling at 134 feet.

Stephens County

Magnolia Petroleum Co. No. 4 Wilson, SE NW NE section 34-1s-5w, an old well in the Santa Fe pool, Stephens County, was deepened from 728 feet to 1,045 feet and pumped 6 bbls. of oil daily from Pontotoc formation.

Magnolia Petroleum Co. No. 1 Wilson, SE NW NE section 34-1s-5w, an old well, was being deepened and was at 915 feet when machine burned.

Jefferson County

Rips & Ungerman No. 4 Penniston, SW NE SW section 16-7s-5w, Seay pool, Jefferson County, had Hoxbar sand at 695-720 feet, total depth, and produced 200,000 feet of gas daily.

Other First Reports

In Grady County, T. H. McCasland No. 1-A Hawkins, SW cor. section 5-3n-5w, was rigging up rotary tools.

In Logan County, Sinclair Prairie Oil Co. No. 1 Crews, SW SW NE section 27-16-1e, was a location.

In Payne County, Mid-Continent Petroleum Corp. and associates No. 2 Columbia, NE NW SW section 18-18-2e, Ramsey pool, was digging cellar; same operators' No. 2 Ramsey, NW SW NW section 18-18-2e, was digging cellar.

In Okfuskee County, Burke-Greis Oil Co. No. 1 Capps, SE cor. section 7-13-7, wildcat, was moving in tools.

Michigan Fields

(Continued from Page 126)

State Land Sale

Sale of leases on more than 10,000 acres of state-owned lands in six counties for oil and gas prospecting has been authorized by the state conservation department, including nearly 8,000 acres in five townships adjacent to the spectacular Chapman discovery well in Edenville Township (16n-1w), Midland County. Also included in the auction will be an 80-acre tract in well proved territory in section 20, Bentley Township (17n-2e), Gladwin County, on which the state will ask a sliding scale of royalties, running up to one-quarter interest.

No acreage in Edenville is to be offered, though the state owns almost half of the township's 23,000 acres. About 10,000 acres of state lands in that township already are under lease. About 300 acres within a 3-mile radius of the Chapman discovery are being held for later offering—at royalties higher than the usual rate.

The Midland County acreage to be offered is as follows: Lincoln Township (15n-1e), 470 acres; Larkin (15n-2e), 654 acres; Jerome (15n-1w), 2,800 acres; Hope (16n-1e), 780 acres; Mills (16n-2e), 3,235 acres.

The remainder of the acreage to be offered at auction is 460 acres in Allegan County, 1,140 acres in Clare County, 644 acres in Ogemaw County, 349 acres in Arenac County, and 160 acres in Saginaw County.

Summary of Operations, All Fields, February

SUMMARY OF ALL FIELDS

Wells Completed

	Comp.	Prod.	Dry	Gas
Eastern fields	364	1,422	17	64
Lima	3	60	0	1
Central Ohio	63	337	14	41
Indiana	16	76	7	5
Kentucky	57	654	16	15
Illinois	44	17,274	11	0
Michigan	62	10,546	20	2
Kansas	127	65,065	31	4
Oklahoma	129	18,657	36	12
North Cent. Tex.	179	39,373	68	2
West Texas	192	120,585	37	3
Texas Panhandle	53	16,972	3	9
East Cent. Texas	20	2,723	7	2
East Texas field	195	10,312	7	0
East Texas border	9	3,900	1	0
Gulf Coast Texas	76	27,297	17	0
Southwest Texas	199	21,000	57	7
North Louisiana	41	15,910	9	4
Gulf Coast Louisiana	30	7,416	9	1
Arkansas	11	6,650	2	0
Mississippi	1	0	1	0
Montana	3	70	1	0
Wyoming	12	957	2	2
Colorado	2	492	1	0
New Mexico	40	15,110	8	0
Nebraska	1	0	1	0
Ttl. Feb.	1,929	402,858	383	174
Ttl. Jan.	2,116	521,334	445	216
Difference	187	118,476	62	42

Rigs and Wells Drilling

	Rigs	Drlg.	Ttl.
Eastern fields	50	301	351
Lima	1	7	8
Central Ohio	49	67	116
Indiana	2	25	27
Kentucky	4	72	76
Illinois	44	81	125
Michigan	19	127	146
Kansas	45	263	308
Oklahoma	48	301	349
North Central Texas	96	312	408
West Texas	115	333	448
Texas Panhandle	37	107	144
East Central Texas	9	43	52
East Texas field	37	100	137
East Texas border	11	27	38
Gulf Coast Texas	24	121	145
Southwest Texas	48	199	247
North Louisiana	29	64	93
Gulf Coast Louisiana	11	87	98
Arkansas	18	34	52
Mississippi	5	6	11
Alabama	2	0	2
Florida	1	1	2
Montana	2	48	50
Wyoming	8	67	75
Colorado	1	28	29
New Mexico	10	174	184
Utah	1	7	8
Nebraska	0	5	5
Ttl. Feb.	727	3,007	3,734
Ttl. Jan.	680	3,063	3,743
Difference	47	56	9

KANSAS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Barber	2	163	1	0	1	6
Barton	20	8,929	6	0	2	21
Butler	7	363	2	0	0	7
Chase	1	152	0	0	0	1
Chautauqua	1	0	1	0	0	3
Clark	1	0	1	0	0	1
Cowley	4	100	2	1	0	12
Elk	0	0	0	0	0	1
Ellis	9	*19,744	0	0	5	23
Ellsworth	6	4,896	1	0	1	6
Grant	1	0	0	1	0	0
Greenwood	3	35	2	0	0	10
Harper	0	0	0	0	0	1
Harvey	2	1,664	0	0	0	2
Jackson	0	0	0	0	0	1
Jewell	0	0	0	0	0	1
Kingman	0	0	0	0	0	1
Lane	0	0	0	0	0	1
Marion	1	0	1	0	0	2
McPherson	7	1,985	2	0	6	10
Meade	0	0	0	0	0	1
Montgomery	1	84	0	0	0	0
Ness	0	0	0	0	1	5
Pawnee	0	0	0	0	1	0
Phillips	0	0	0	0	0	1
Pratt	0	0	0	0	0	1
Reno	4	2,528	1	0	2	10
Rice	8	5,437	1	0	6	28
Rooks	0	0	0	0	1	6
Rush	0	0	0	0	0	1
Russell	22	13,626	1	0	8	51
Sedgwick	4	439	1	0	1	6
Stafford	12	4,765	6	0	3	15
Stevens	2	0	0	2	2	4
Sumner	1	0	1	0	1	7
Trego	0	0	0	0	0	3
Woodson	8	155	1	0	4	14
Ttl. Feb.	127	65,065	31	4	45	263
Ttl. Jan.	155	104,901	33	18	54	282
Difference	28	39,836	2	14	9	19

*Potentials.

OKLAHOMA

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Atoka	0	0	0	0	0	3
Beckham	1	0	1	0	0	2
Bryan	0	0	0	0	0	1
Caddo	3	3,680	0	2	1	14
Carter	8	128	2	1	5	11
Choctaw	0	0	0	0	0	2
Cleveland	0	0	0	0	1	4
Coal	1	323	0	0	0	1
Comanche	0	0	0	0	1	3
Cotton	0	0	0	0	0	1
Creek	18	755	5	4	4	35
Garfield	0	0	0	0	0	3
Garvin	2	25	1	0	0	3
Grady	0	0	0	0	1	3
Grant	2	434	1	0	1	1
Greer	0	0	0	0	0	2
Hughes	5	200	3	1	0	5
Jefferson	4	42	1	0	0	6
Johnston	0	0	0	0	0	2
Kay	2	90	1	0	2	1
Kiowa	0	0	0	0	0	2
Lincoln	5	1,506	0	0	3	7
Logan	0	0	0	0	0	5
Marshall	0	0	0	0	0	1
Murray	0	0	0	0	0	1
Muskogee	4	5	3	0	2	5
Noble	1	194	0	0	0	4
Okfuskee	6	172	3	0	1	4
Oklahoma	5	3,498	0	0	2	21
Okmulgee	14	205	4	0	5	29
Osage	7	821	2	0	1	23
Pawnee	2	136	1	0	0	1
Payne	0	0	0	0	0	4
Pontotoc	11	2,329	3	0	4	23
Pottawatomie	3	302	0	0	3	13
Seminole	11	3,607	0	1	7	30
Stephens	3	15	1	0	2	9
Texas	1	0	0	1	0	2
Tillman	1	0	1	0	1	4
Tulsa	6	5	3	2	1	7
Washita	0	0	0	0	0	1
Wagoner	3	185	0	0	0	2
Ttl. Feb.	129	18,657	36	12	48	301
Ttl. Jan.	135	19,377	46	13	39	319
Difference	6	720	10	1	9	18

CENTRAL AND NORTH TEXAS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Archer	11	1,285	3	0	6	18
Baylor	0	0	0	0	0	1
Brown	4	26	3	0	1	10
Callahan	8	0	8	0	0	10
Clay	8	1,938	1	0	3	6
Coleman	1	0	1	0	1	4
Comanche	0	0	0	0	0	2
Cooke	10	839	3	0	5	8
Denton	1	0	1	0	0	2
Eastland	4	290	1	1	0	7
Fannin	0	0	0	0	0	1
Foard	2	365	0	1	0	0
Grayson	0	0	0	0	0	3
Haskell	1	31	0	0	1	1
Jack	16	4,035	3	0	6	14
Johnson	0	0	0	0	0	1
Mills	1	0	1	0	0	0
Montague	9	348	2	0	1	7
Palo Pinto	3	0	3	0	0	6
Parker	0	0	0	0	0	2
Shackelford	18	65	14	0	6	18
Stephens	1	0	1	0	0	4
Throckmorton	1	0	1	0	0	4
Wichita	49	23,583	9	0	54	142
Wilbarger	4	135	3	0	3	11
Wise	0	0	0	0	0	2
Young	27	6,433	10	0	9	28
Ttl. Feb.	179	39,373	68	2	96	312
Ttl. Jan.	207	65,546	84	4	89	276
Difference	28	26,173	16	2	7	36

EAST TEXAS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Anderson	4	78	1	2	3	6
Angelina	1	0	1	0	1	3
Bowie	1	0	1	0	0	1
Cherokee	3	0	3	0	0	2
Dallas	0	0	0	0	0	2
Delta	0	0	0	0	0	1
Falls	0	0	0	0	0	1
Fanning	0	0	0	0	0	1
Franklin	5	1,012	0	0	1	4
Freestone	1	148	0	0	0	0
Gregg	94	5,477	1	0	24	49
Henderson	2	140	1	0	3	4
Hill	0	0	0	0	0	1
Houston	0	0	0	0	0	4
Lamar	0	0	0	0	0	1
Leon	0	0	0	0	0	2
Limestone	1	0	1	0	0	2
Madison	0	0	0	0	0	1
Navarro	0	0	0	0	0	3
Rockwall	0	0	0	0	0	1
Rusk	79	4,039	2	0	9	39
Smith	2	40	1	0	1	2
Titus	4	1,335	1	0	0	3
Trinity	1	0	1	0	0	1
Upshur	17	766	0	0	3	8
Van Zandt	0	0	0	0	1	1
Total Feb.	215	13,035	14	2	46	143
Total Jan.	201	13,817	16	1	54	139
Difference	14	782	2	1	8	4

TEXAS PANHANDLE

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Armstrong	0	0	0	0	0	1
Carson	6	1,450	0	1	0	9
Cottle	0	0	0	0	0	1
Collingsw'rth	0	0	0	0	0	2
Deaf Smith	0	0	0	0	0	1
Dickens	0	0	0	0	0	1
Floyd	0	0	0	0	0	1
Gray	15	5,484	0	2	15	32
Hall	0	0	0	0	0	1
Hansford	0	0	0	0	0	1
Hartley	0	0	0	0	0	1
Hutchinson	25	9,850	1	2	18	38
Lamb	0	0	0	0	0	1
Moore	2	0	0	2	1	6
Ochiltree	0	0	0	0	0	1
Potter	0	0	0	0	0	1
Roberts	0	0	0	0	0	2
Sherman	0	0	0	0	0	1
Wheeler	5	188	2	2	3	6
Total Feb.	53	16,972	3	9	37	107
Total Jan.	72	27,241	5	17	30	128
Difference	19	10,269	2	8	7	21

WEST TEXAS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Andrews	2	846	0	0	3	11
Bailey	0	0	0	0	0	1
Brewster	0	0	0	0	0	3
Cochran	2	878	0	0	2	3
Coke	0	0	0	0	0	2
Crane	7	7,023	1	0	10	2
Crockett	2	0	2	0	1	3
Culberson	2	0	2	0	1	0
Dawson	0	0	0	0	0	1
Ector	46	44,756	1	0	21	81
Edwards	0	0	0	0	0	3
El Paso	0	0	0	0	0	1
Fisher	7	1,394	3	0	1	7
Gaines	7	2,599	3	0	0	5
Garza	0	0	0	0	1	0
Glasscock	0	0	0	0	1	0
Hockley	0	0	0	0	1	4
Howard	15	9,786	2	0	7	19
Hudspeth	0	0	0	0	0	2
Irion	0	0	0	0	0	1
Jeff Davis	0	0	0	0	0	1
Jones	19	2,935	10	0	9	29
Kent	0	0	0	0	2	0
Lynn	0	0	0	0	0	1
Loving	1	0	1	0	3	2
Menard	0	0	0	0	0	2
McCulloch	1	0	1	0	0	2
Mitchell	2	149	1	0	2	0
Nolan	0	0	0	0	0	1
Pecos	9	3,489	2	2	5	25
Presido	0	0	0	0	0	1
Reeves	0	0	0	0	1	3
Runnels	1	0	1	0	0	1
Schleicher	0	0	0	0	0	3
Scurry	0	0	0	0	0	3
Sterling	0	0	0	0	0	1
Stonewall	0	0	0	0	0	2
Sutton	1	0	1	0	1	0
Taylor	1	8	0	0	1	3
Terrell	0	0	0	0	0	1
Terry	1	0	1	0	0	0
Tom Green	0	0	0	0	2	2
Upton	15	8,225	3	0	19	20
Val Verde	3	25	0	0	4	0
Ward	18	14,121	2	0	5	36
Winkler	20	12,851	0	1	8	24
Yoakum	10	11,500	0	0	5	22
Ttl. Feb.	192	120,585	37	3	115	333
Ttl. Jan.	207	122,513	24	0	99	338
Difference	15	1,928	13	3	16	5

SOUTHWEST TEXAS

Summary of Field Operations

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Agua Dulce	0	0	0	0	1	3
Alta Mesa	2	347	0	0	0	1
Alta Verde	0	0	0	0	0	2
Alworth	0	0	0	0	0	1
Benavides	16	2,435	0	1	3	11
Branyon	4	473	1	0	0	4
Bruni	0	0	0	0	0	1
Buchannan	1	15	0	0	1	3
Burdette Wells	0	0	0	0	0	3
Calliham	1	15	0	0	0	1
Charco-Rendondo	0	0	0	0	0	1
Chittim	0	0	0	0	0	1
Clara Driscoll	1	124	0	0	0	0
Colorado	0	0	0	0	0	1
Colmena	0	0	0	0	0	1
Dale	6	275	1	0	0	3
Darst Creek	1	95	0	0	2	3
Dunlap	0	0	0	0	0	2
Eagle Hill	0	0	0	0	1	0
E. Premont	0	0	0	0	0	1
E. Telferner	1	40	0	0	0	1
Escobas	1	0	1	0	0	2
E. White Pt.	1	216	0	0	0	0
Eckert	0	0	0	0	0	1
Ezzell	6	324	1	0	2	5
Flour Bluff	3	213	1	0	1	2
Govt. Wells	0	0	0	0	0	1
Heyser	8	1,213	0	0	2	5
Hoffman	5	337	0	0	2	3
Hughes	1	0	1	0	0	0
Keeran	0	0	0	0	1	0
Killam	6	320	2	0	0	3
Kingsville	1	0	1	0	0	2
Labbe	2	0	2	0	1	1
Las Animas	0	0	0	0	0	1
Loma Alta	0	0	0	0	0	1
Luby	4	570	0	0	1	3
Luling	9	1,088	1	0	0	3
Lundell	3	281	0	0	0	1
Lytton Spgs.	2	5	1	0	0	0
Macdona	1	20	0	0	0	1
McCampbell	8	1,215	0	0	1	4
McFaddin	3	274	0	1	1	1
Maetze	0	0	0	0	0	1
Mercedes	0	0	0	0	0	1
Mirando Valley	0	0	0	0	0	1
Normanna	0	0	0	0	0	1
N. Agua Dulce	1	0	0	1	0	0
N. Normanna	1	60	0	0	0	0
Nash Creek	0	0	0	0	0	1
Ollton	13	1,507	0	2	3	9
Peters	2	0	1	1	0	1
Piedra Lumbre	2	480	0	0	0	1
Placedo	1	122	0	0	1	2
Plummer	1	0	1	0	0	1
Premont	0	0	0	0	1	1
Plymouth	3	576	0	0	0	2
Refugio	1	241	0	0	0	3
Rhodes	0	0	0	0	0	1
Rincon	1	0	0	1	0	0
Richard King	1	81	0	0	0	1
Ricaby	0	0	0	0	0	1
Salt Flat	5	153	0	0	1	2
SamFordyce	3	541	0	0	1	3
Sarnosa	2	35	1	0	0	0
Saxet	6	519	1	0	4	8
Seven Sisters	2	72	1	0	0	2
S. Burnell	4	508	0	0	1	2
S. Clara Driscoll	0	0	0	0	0	1
Somerset	0	0	0	0	1	1
Stratton	0	0	0	0	0	1
Sweden	0	0	0	0	0	1
Taft	0	0	0	0	0	1
Taylor	0	0	0	0	0	1
TomOconnor	7	5,759	0	0	2	6
Von Ormy	5	39	0	0	0	1
Weslaco	1	62	0	0	0	0
W. Saxet	1	350	0	0	1	4
Zoboroski	0	0	0	0	0	1
Miscellaneous	39	0	39	0	9	49
Ttl. Feb.	199	21,000	57	7	48	199
Ttl. Jan.	206	24,558	55	19	53	177
Difference	7	3,558	2	12	5	22

GULF COAST LOUISIANA

Summary of Field Operations

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Anse LaButte	1	0	1	0	0	1
Bayou Blue	1	0	0	0	0	1
Bay St. Elaine	0	0	0	0	0	1
Bayou Cocotriz	1	928	0	0	0	1
Bayou Des Allemands	0	0	0	0	0	2
Big Lake	0	0	0	0	0	2
Black Bayou	0	0	0	0	0	1
Bosco	1	184	0	0	0	1
Caillou Island	0	0	0	0	0	1
Cameron Meadows	1	540	0	0	0	2
Charenton	2	389	1	0	0	1
Chenevville	0	0	0	0	0	1
Choctaw	0	0	0	0	0	2
Darrow	1	620	0	0	1	0
Dog Lake	0	0	0	0	0	1
Edgerly	0	0	0	0	0	1
Fausse Point	0	0	0	0	0	1
Four Isle	0	0	0	0	0	1
Gillis	1	0	1	0	0	1
Garden Island	0	0	0	0	0	2
Hackberry	1	0	0	1	0	5
Horshoe Bayou	0	0	0	0	0	1
Jeanerette	1	0	1	0	0	1
Jennings	2	20	1	0	1	10
Lafitte	2	1,318	0	0	0	2
Lake Hermitage	0	0	0	0	0	1
Lake Long	1	416	0	0	1	0
Lake Pelto	0	0	0	0	0	1
Leesville	1	950	0	0	0	1
Lirette	1	0	1	0	1	1
North Crowley	2	740	1	0	0	2
New Iberia	2	426	0	0	0	3
Potash	1	0	1	0	0	1
Quarantine Bay	0	0	0	0	0	1
Roanoke	2	208	0	0	0	1
South Elton	0	0	0	0	0	1
South Jennings	0	0	0	0	0	0
Sorrento	0	0	0	0	0	1
Starks	1	48	0	0	0	1
Sulphur	0	0	0	0	0	4
Valentine	1	0	1	0	0	3
Venice	0	0	0	0	0	2
Villa Platte	1	504	0	0	0	3
Vinton	1	75	0	0	0	1
Welsh	0	0	0	0	0	2
White Castle	0	0	0	0	0	1
Woodlawn	1	50	0	0	0	1
Misc.	0	0	0	0	7	12
Ttl. Feb.	30	7,416	9	1	11	87
Ttl. Jan.	58	12,312	32	0	22	81
Difference	28	4,896	23	1	11	6

TEXAS GULF COAST

Summary of Field Operations

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Amelia	1	52	0	0	0	2
Anahuac	4	1,252	1	0	0	2
Bay City	0	0	0	0	0	3
Barbers Hill	0	0	0	0	0	3
Big Hill	0	0	0	0	0	1
Buckeye	0	0	0	0	0	1
Cheek	1	198	0	0	0	0
Cedar Bayou	0	0	0	0	0	1
Cedar Point	1	642	0	0	0	0
Clinton	0	0	0	0	0	1
Cleveland	0	0	0	0	0	1
Danbury	1	0	1	0	0	2
Dickinson	6	2,810	1	0	0	8
Esperson	1	0	1	0	1	0
Fairbanks	1	22	0	0	1	2
Fannett	0	0	0	0	0	1
Five Corners	1	288	0	0	0	2
Friendswood	5	2,957	0	0	2	3
Garwood	1	0	1	0	0	0
Hardin	8	3,477	0	0	2	11
Hastings	11	6,250	0	0	4	10
High Island	0	0	0	0	0	2
Hitchcock	0	0	0	0	1	1

Hull	0	0	0	0	0	2
Labelle	0	0	0	0	0	1
Livingston	1	120	0	0	0	0
Louise	0	0	0	0	0	1
Lockridge	1	90	0	0	0	4
Magnet	1	127	0	0	0	2
Manvel	3	1,149	1	0	0	2
Markham	1	0	1	0	0	1
Nome	1	0	1	0	1	2
North Chekk.	0	0	0	0	0	1
Old Ocean	0	0	0	0	0	3
Orchard	0	0	0	0	0	2
Orange	1	690	0	0	2	3
Palacios	0	0	0	0	1	1
Pickett Ridge	1	120	0	0	0	1
Pierce Jct.	1	384	0	0	0	1
Sandy Point	0	0	0	0	1	1
Silsbee	1	443	0	0	0	1
Satsuma	1	72	0	0	0	1
Seabreeze	0	0	0	0	0	2
Segno	1	315	0	0	0	2
South Call	0	0	0	0	0	1
Sindletop	1	134	0	0	0	2
Spurger	1	631	0	0	0	1
Thompson	1	141	0	0	0	1
Tomball	6	2,446	1	0	0	4
Turtle Bay	1	0	1	0	0	2
VanVleck	1	709	0	0	0	2
W. Columbia	1	983	0	0	1	3
Withers	1	295	0	0	0	2
Misc.	7	0	7	0	7	10
Ttl. Feb.	76	27,297	17	0	24	121
Ttl. Jan.	121	43,147	19	4	19	107
Difference	45	15,850	2	4	5	14

EAST TEXAS BORDER

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bowie	1	0	1	0	1	1
Cass-Rodessa	0	0	0	0	0	6
Cass-other	0	0	0	0	1	1
Harrison	0	0	0	0	1	1
Marion-Rodessa	8	3,900	0	0	4	15
Marion-other	0	0	0	0	0	1
Panola	0	0	0	0	2	2
Shelby	0	0	0	0	2	0
Ttl. Feb.	9	3,900	1	0	11	27
Ttl. Jan.	9	2,195	2	1	8	15
Difference	0	1,705	1	1	3	12

NORTH LOUISIANA

Summary of Field Operations

Parish—	Comp.	Drod.	Dry	Gas	Rgs.	Dlg.
Bienville	0	0	0	0	0	1
Bossier	1	100	0	0	2	1
Caddo-Rodessa	4	1,375	0	0	0	6
Caddo-other	6	60	3	0	5	8
Caldwell	1	0	1	0	0	0
Catahoula	0	0	0	0	1	0
Claiborne	9	8,795	0	0	2	9
De Soto	2	195	0	0	1	7
Franklin	0	0	0	0	1	0
La Salle	2	5	1	0	0	0
Lincoln	5	3,905	1	0	4	1
Morehouse	0	0	0	0	1	3
Natchitoches	1	0	1	0	1	0
Ouachita	0	0	0	0	2	2
Red River	1	0	1	0	0	1
Sabine	2	145	0	0	0	6
Tensas	1	0	1	0	0	0
Union	0	0	0	0	3	4
Webster	6	1,330	0	4	6	14
Winn	0	0	0	0	0	1
Ttl. Feb.	41	15,910	9	4	29	64
Ttl. Jan.	59	28,830	7	9	23	73
Difference	18	12,920	2	5	6	9

Gas production: Cotton Valley, Webster Parish, 23,000,000 ft.

ARKANSAS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Calhoun	0	0	0	0	1	0
Cleveland	0	0	0	0	1	0
Columbia	0	0	0	0	1	4
Crittenden	0	0	0	0	1	0
Desha	0	0	0	0	1	0
Hempstead	0	0	0	0	2	0
Lafayette	0	0	0	0	0	1
Lincoln	0	0	0	0	1	0
Little River	0	0	0	0	2	0
Lonoke	1	0	1	0	1	0
Miller-Rodessa	3	805	0	0	1	9
Nevada	0	0	0	0	2	0
Ouachita	1	0	1	0	1	1
Pulaski	0	0	0	0	1	0
Union	6	5,845	0	0	2	19
Ttl. Feb.	11	6,650	2	0	18	34
Ttl. Jan.	22	16,040	2	1	19	31
Difference	11	9,390	0	1	1	3

ALABAMA

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Houston	0	0	0	0	1	0
Mobile	0	0	0	0	1	0
Ttl. Feb.	0	0	0	0	2	0
Ttl. Jan.	0	0	0	0	2	0
Difference	0	0	0	0	0	0

FLORIDA

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Lake	0	0	0	0	1	0
Nassau	0	0	0	0	0	1
Ttl. Feb.	0	0	0	0	1	1
Ttl. Jan.	0	0	0	0	1	1
Difference	0	0	0	0	0	0

MISSISSIPPI

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Claiborne	0	0	0	0	2	0
George	0	0	0	0	0	1
Harrison	0	0	0	0	0	1
Hancock	0	0	0	0	1	0
Hinds	0	0	0	0	0	2
Lamar	1	0	1	0	0	1
Perry	0	0	0	0	0	1
Simpson	0	0	0	0	1	0
Yalobusha	0	0	0	0	1	0
Ttl. Feb.	1	0	1	0	5	6
Ttl. Jan.	3	0	3	0	6	6
Difference	2	0	2	0	1	0

ROCKY MOUNTAIN AREA

New Mexico

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bernalillo	0	0	0	0	0	1
McKinley	0	0	0	0	0	7
San Juan	2	55	1	0	0	1
San Miguel	0	0	0	0	0	3
Socorro	0	0	0	0	0	1
Torrance	0	0	0	0	0	1
Valencia	0	0	0	0	0	3
Lea	28	13,627	2	0	10	109
Eddy	8	1,428	3	0	0	37
Chaves	1	0	1	0	0	3
Curry	1	0	1	0	0	1
DeBaca	0	0	0	0	0	3
Dona Ana	0	0	0	0	0	1
Roosevelt	0	0	0	0	0	1
Otero	0	0	0	0	0	2
Total Feb.	40	15,110	8	0	10	174
Total Jan.	41	14,422	4	1	7	147
Difference.	1	688	4	1	3	27

Colorado

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	0	0	0	0	0	2
Archuleta	0	0	0	0	0	5
Boulder	1	0	1	0	0	0
Cheyenne	0	0	0	0	0	1
Huerfano	0	0	0	0	0	2
La Plate	0	0	0	0	0	2
Mesa	0	0	0	0	0	2
Moffat	0	0	0	0	0	1
Park	0	0	0	0	0	3
Rio Blanco	1	492	0	0	0	1
Routt	0	0	0	0	1	1
Miscellaneous	0	0	0	0	0	8
Total Feb.	2	492	1	0	1	28
Total Jan.	0	0	0	0	1	30
Difference.	2	492	1	0	0	2

Wyoming

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Albany	0	0	0	0	0	2
Big Horn	1	15	0	0	0	5
Carbon	0	0	0	0	0	7
Converse	0	0	0	0	1	1!
Fremont	0	0	0	0	0	6
Hot Springs	0	0	0	0	0	4
Lincoln	0	0	0	0	0	4
Natrona	4	758	0	0	0	2
Niobrara	2	0	1	1	2	6
Park	0	0	0	0	0	3
Sweetwater	4	184	0	1	1	4
Uinta	0	0	0	0	0	3
Washakie	1	0	1	0	0	1
Weston	0	0	0	0	4	7
Miscellaneous	0	0	0	0	0	2
Total Feb.	12	957	2	2	8	67
Total Jan.	12	3,422	1	4	7	76
Difference.	0	2,465	1	2	1	9

Montana

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Big Horn	0	0	0	0	0	2
Carbon	0	0	0	0	0	5
Fergus	0	0	0	0	0	6
Glacier	1	50	0	0	0	4
Hill	0	0	0	0	1	1
Petroleum	0	0	0	0	0	2
Pondera	0	0	0	0	1	1
Toole	2	20	1	0	0	13
Yellowstone	0	0	0	0	0	3
Miscellaneous	0	0	0	0	0	11
Total Feb.	3	70	1	0	2	48
Total Jan.	3	150	2	0	2	44
Difference.	0	80	1	0	0	4

Utah

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Total Feb.	0	0	0	0	1	7
Total, Jan.	0	0	0	0	1	7
Difference.	0	0	0	0	0	0

NEBRASKA

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Sioux	1	0	1	0	0	0
Miscellaneous	0	0	0	0	0	5
Total Feb.	1	0	1	0	0	5
Total Jan.	0	0	0	0	0	6
Difference.	1	0	1	0	0	1

EASTERN FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bradford	*177	892	0	0	4	61
Allegany	†62	37	0	0	4	27
Middle Dis't.	‡17	43	0	0	2	13
N.Y.-Pa. Gas	5	0	3	2	6	14
Butler-Armstrong	7	5	0	4	1	10
S.W. Pa.	14	6	0	11	4	29
S.E. Ohio	23	349	6	7	6	33
W. Va.	59	90	8	40	23	114
Ttl. Feb.	364	1,422	17	64	50	301
Ttl. Jan.	365	789	42	75	64	333
Difference	1	633	25	11	14	32

*Includes 56 water intake wells. †Includes 25 water intake wells. ‡Includes 4 pressure wells.

CENTRAL AND SOUTHEAST OHIO

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Ashland	3	0	0	3	2	1
Athens	7	0	1	6	3	3
Belmont	0	0	0	0	3	2
Coshocton	1	0	1	0	1	0
Cuyahoga	0	0	0	0	1	3
Fairfield	1	0	0	1	1	1
Gallia	0	0	0	0	0	1
Guernsey	5	0	0	5	2	3
Hocking	0	0	0	0	1	1
Holmes	0	0	0	0	1	0
Huron	1	0	1	0	0	2
Jackson	0	0	0	0	0	1
Knox	5	137	0	4	3	4
Lawrence	1	0	0	1	2	0
Licking	7	14	2	3	6	2
Lorain	2	0	0	2	2	1
Meigs	1	0	0	1	3	4
Monroe	3	0	1	2	2	5
Morgan	3	0	3	0	1	2
Muskingum	5	60	1	2	2	4
Noble	0	0	0	0	0	5
Perry	1	6	0	0	4	2
Richland	1	0	0	1	1	0
Stark	3	0	0	3	0	6
Summit	2	0	2	0	1	0
Tuscarawas	3	0	0	3	2	5
Vinton	1	0	0	1	0	0
Washington	7	20	2	3	6	9
Ttl. Feb.	63	237	14	41	50	67
Ttl. Jan.	61	412	13	34	31	99
Difference.	2	175	1	7	19	32

LIMA FIELD

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Greene	0	0	0	0	0	1
Hancock	0	0	0	0	0	1
Putman	1	35	0	0	1	1
Seneca	0	0	0	0	0	3
Wood	1	25	0	0	0	1
Sandusky	1	0	0	1	0	0
Ttl. Feb.	3	60	0	1	1	7
Ttl. Jan.	2	20	0	1	2	5
Difference	1	40	0	0		1 2

EASTERN KENTUCKY

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Lee	9	173	0	0	1	7
Powell	1	0	1	0	0	2
Pike	0	0	0	0	0	3
Martin	4	30	1	2	0	8
Magoffin	2	6	1	0	0	1
Wolffe	0	0	0	0	0	1
Floyd	12	75	0	9	2	8
Knott	2	0	0	2	0	0
Johnson	1	0	0	1	0	0
Perry	0	0	0	0	0	1
Lawrence	1	0	0	1	1	0
Ttl. Feb.	32	284	3	15	4	31
Ttl. Jan.	15	248	3	3	1	28
Difference	17	36	0	12	3	3

WESTERN KENTUCKY

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Breckenridge	0	0	0	0	0	4
Caldwell	1	0	1	0	0	0
Daviess	2	10	1	0	0	5
Grayson	1	0	1	0	0	0
Hancock	5	20	3	0	0	3
Henderson	1	12	0	0	0	1
Logan	0	0	0	0	0	1
McLean	3	200	0	0	0	9
Muhlenberg	1	3	0	0	0	2
Ohio	11	125	7	0	0	13
Todd	0	0	0	0	0	1
Webster	0	0	0	0	0	2
Ttl. Feb.	25	370	13	0	0	41
Ttl. Jan.	48	539	18	9	0	37
Difference	23	169	5	9	0	4

INDIANA

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Crawford	0	0	0	0	0	1
Daviess	1	0	0	1	1	1
Dearborn	0	0	0	0	0	1
DeKalb	0	0	0	0	0	1
Gibson	0	0	0	0	0	1
Hancock	2	0	0	1	0	1
Harrison	0	0	0	0	0	1
Henry	1	0	0	1	0	0
Huntington	0	0	0	0	0	1
Jay	1	10	0	0	0	1
Jennings	0	0	0	0	0	1
Knox	2	0	0	2	0	0
LeGrange	0	0	0	0	0	1
Perry	0	0	0	0	0	2
Pike	1	0	1	0	0	0
Jefferson	2	0	2	0	0	2
Porter	0	0	0	0	0	1
Posey	0	0	0	0	0	3
Rush	0	0	0	0	0	1
Spencer	1	9	0	0	1	0
Sullivan	3	0	3	0	0	4
Vigo	1	57	0	0	0	1
Wabash	1	0	1	0	0	0
Total Feb.	16	76	7	5	2	25
Total Jan.	5	0	5	0	0	35
Difference.	11	76	2	5	2	10

MICHIGAN

Summary of Field Operations

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	1	140	0	0	1	2
Bentley	3	283	0	0	0	9
Broomfield	2	0	2	0	0	0
Buckeye, N.	10	2,440	1	0	1	11
Buckeye, S.	8	2,916	0	0	1	10
Clayton	2	114	0	0	1	6
Crystal	1	50	0	0	0	0
Deerfield	0	0	0	0	0	1
Edenville	1	1,200	0	0	3	4
New Haven	0	0	0	0	0	1
Porter-Yost	1	319	0	0	0	1
Salem	7	1,768	0	1	2	5
Secord	1	0	1	0	0	1
Sherman	4	1,025	1	0	0	3
West Branch	4	285	0	0	3	7
Winfield	0	0	0	0	0	1
Wisner	0	0	0	0	1	0
Wildcats	17	6	15	1	6	65
Total Feb.	62	10,546	20	2	19	127
Total Jan.	69	13,930	22	2	24	133
Difference.	7	3,384	2	0	5	6

ILLINOIS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bond	0	0	0	0	0	3
Bureau	0	0	0	0	0	1
Clark	1	0	1	0	0	1
Clay	5	1,762	0	0	3	1
Clinton	8	779	2	0	19	7
Coles	0	0	0	0	0	4
Cumberland	0	0	0	0	0	1
DeKalb	0	0	0	0	0	2
Dewitt	0	0	0	0	0	1
Edwards	0	0	0	0	0	2
Effingham	1	0	1	0	1	1
Fayette	0	0	0	0	1	5
Franklin	0	0	0	0	0	1
Greene	0	0	0	0	0	1
Hamilton	1	0	1	0	0	1
Hardin	0	0	0	0	0	1
Iroquois	0	0	0	0	0	1
Jackson	0	0	0	0	0	1
Jasper	1	0	1	0	0	1
Jefferson	2	0	2	0	1	3
Madison	0	0	0	0	0	1
Marion	3	43	1	0	2	9
Massac	0	0	0	0	0	1
Montgomery	1	0	1	0	0	0
Pope	0	0	0	0	0	1
Randolph	0	0	0	0	0	2
Richland	20	14,690	0	0	14	15
Rock Island	0	0	0	0	0	1
Saline	0	0	0	0	0	2
Shelby	0	0	0	0	0	1
Vermilion	0	0	0	0	0	1
Wabash	0	0	0	0	0	1
Washington	0	0	0	0	0	2
Wayne	*	0	1	0	1	4
White	0	0	0	0	1	0
Will	0	0	0	0	0	1
Williamson	0	0	0	0	1	0
Ttl. Feb.	44	17,274	11	0	44	81
Ttl. Jan.	35	6,939	7	0	29	110
Difference	9	10,335	4	0	15	29

Drilling Contractors

(Continued from Page 121)

locations in Chambers and Wharton counties, the activity was confined to proven fields. The majority of the new work was reported for the Hastings and Dickinson field, while new activity was started at Anahuac, Barbers Hill, High Island, Batson, Amelia, Nome, Hardin, Orange, Segno, Friendswood, Pierce Junction, Tomball, Thompson, and Boling fields.

Ontario Operations

In the Tilbury field, Kent County, Ontario, Union Gas Co. No. 297, E half Lot 160, North Talbot Road, Raleigh Township, finished at 1,430 feet with a natural flow of 180,000 feet a day. It will not be shot. Union No. 298 is starting in W half Lot 159, Talbot Road North, Raleigh Township.

In the Eden field, Elgin County, E. P. Rowe No. 2, Carman Ball farm, Lot 27, Concession 8, Bayham Township, finished a dry hole after drilling through the Clinton sand.

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location and county—	S.T.R.	Depth	Status
Wilshire Oil, No. 1 Gaviota, Santa Barbara	35- 5-33	2,897	br. sh. drlg.
Hancock-Bush, No. 2-W Santa Maria, Santa Barbara	30-10-33	4,650	rig to pump
Hancock-Bush, No. 3 Brown, Santa Maria, Santa Barb.	25-10-33	3,684	sd. sh. drlg.
Anderson, Joseph, No. 1 A. & T., Santa Maria, S. Barb.	28-10-34	5,329	pump 325 b.d.
Palm Oil, No. 1 Bill, Santa Maria, Santa Barbara	27-10-34	2,071	sd. sh. drlg.
Cal. Lands, Inc., No. 3 Gallison, Santa Maria, S. Barb.	26-10-34	5,355	sd. sh. drlg.
Moore, E. H., No. 1-H Sugar, Santa Maria, S. Barbara	19-10-34	3,141	sd. sh. drlg.
Pet. Sec., No. 1-C Santa Maria, Santa Barbara	27-10-34	3,990	sd. sh. drlg.
Signal Oil, No. 3 Romalho, Santa Maria, Santa Barb.	27-10-34	3,560	sd. sh. drlg.
Union Oil, No. 2-V Santa Maria, Santa Barbara	21-10-34	4,986	sd. sh. drlg.
Union Oil, No. 2-1-O Santa Maria, Santa Barbara	21-10-34	4,660	sd. sh. drlg.
Union Oil, No. 1 Silva, Santa Maria, Santa Barbara	24-10-35	1,576	sd. sh. drlg.
Union Oil, No. 20 Squires, Orcutt, Santa Barbara	27- 9-34	4,300	pump 170 b.d.
Pet. Equities No. 1 Webber, Santa Maria, Santa Barb.	27-10-34	4,059	sd. sh. drlg.
Wilson Oil, No. 1-B Santa Maria, Santa Barbara	26-10-34	3,376	sd. sh. drlg.
York Oil, No. 2 Doane, Santa Maria, Santa Barbara	27-10-34	4,298	sd. sh. drlg.
Hughes Drlg., No. 1-M Santa Maria, Santa Barbara	27-10-34	2,251	sd. sh. drlg.
Jones, F. E., No. 1-W Santa Maria, Santa Barbara	27-10-34	4,600	pump 164 b.d.
Pac. West Oil, No. 3-S Santa Maria, Santa Barbara	27-10-34	2,491	sd. sh. drlg.
Pac. West. Oil, No. 11-H Santa Maria, Santa Barbara	21-10-34	4,471	pump 490 b.d.
Pima Drlg., No. 1 Morganti, Casmalia, Santa Barbara	13- 9-35	1,777	cleaning out
Standard Oil Co., No. 1 Cat Canyon, Santa Barbara	27- 9-33	5,298	hd. sh. drlg.
Bell, A. E., No. 4 York, Lompoc, Santa Barbara	33- 8-34	3,178	P. B. 3,109
Moyle Pet., No. 1 Gato Ridge, Santa Barbara	9- 8-32	3,496	hd. sh. drlg.
Carpinteria Oil, No. 1 Carpinteria, Santa Barbara	32- 4-25	1,620	sd. sh. drlg.
Gauthier Oil, No. 1 Summerland, Santa Barbara	22- 4-26	1,094	sd. sh. drlg.
Fisher, D., No. 1 Cuyama, Santa Barbara	28-11-28	1,255	idle
Rowe, W. G., No. 1 Johnson, Oxnard, Ventura	15- 1-22	4,115	hd. sh. drlg.
High Mesa Oil, No. 1 Butcher, Ojai, Ventura	16- 4-22	1,330	hd. sd. drlg.
Texas Co., No. 5 Yale, South Mountain, Ventura	13- 3-21	2,690	redrlg. 2,360
Texas Co., No. 1 Edwards, Camarillo, Ventura	19- 2-21	6,111	fish D.P.
Section 20 Oil, No. 1 Sespe, Ventura	20- 5-19	1,607	rained out
Condor Oil, No. 1 Dorman, Sespe, Ventura	6- 4-19	2,193	rained out
C. C. M. Oil, No. 19 Rincon, Ventura	17- 3-24	2,761	hd. sh. drlg.
C. C. M. Oil, No. 20 Rincon, Ventura	8- 3-24	4,285	hd. sd. drlg.
Richfield Oil, No. 6-F Rincon, Ventura	17- 3-24	3,230	redrlg. 1,550
General Pet. No. 3 Ferguson, Rincon, Ventura	6- 3-24	3,117	sd. sh. drlg.
Tide Water A. O., No. 19 V.L.W., Ventura, Ventura	26- 3-23	6,804	hd. sd. drlg.
Tide Water A. O., No. 41 V.L.W., Ventura, Ventura	24- 3-23	7,098	hd. sd. drlg.
Tide Water A. O., No. 68 Lloyd, Ventura, Ventura	27- 3-23	2,030	sd. sh. drlg.
Tide Water A. O., No. 69 Lloyd, Ventura, Ventura	27- 3-23	6,765	sd. sh. drlg.
Tide Water A. O., No. 79 Lloyd, Ventura, Ventura	27- 3-23	5,005	swabbing
Tide Water A. O., No. 135 Lloyd, Ventura, Ventura	27- 3-23	9,520	recmtd. 9,514
Tide Water A. O., No. 138 Lloyd, Ventura, Ventura	23- 3-23	8,897	sd. sh. drlg.
Shell Oil, No. 65 Taylor, Ventura Ave., Ventura	30- 3-23	5,920	will deepen
Shell Oil, No. 93 Taylor, Ventura Ave., Ventura	30- 3-23	8,015	O. S. drlg.
General Pet., No. 13 Notten, Ventura Ave., Ventura	28- 3-23	9,871	flow 10 b.d.
Amerada Pet., No. 5 Beer, Devils Den, Kern	22-26-19	6,803	cmtd. 6,801
Rocima Oil, No. 1 Laymance, McKittrick, Kern	20-30-22	1,427	rig to pump
Austin, J. W., No. 1 McKittrick, Kern	26-30-22	674	br. sh. drlg.
Standard Oil, No. 2 Randolph, Semi-Tropic, Kern	14-27-33	9,537	P. B. 7,620
Continental Oil, No. 2 KCL, Wasco, Kern	8-27-24	14,078	sd. sh. drlg.
Chico-Martinez Oil, No. 1 South Belridge, Kern	1-29-20	1,029	cleanin gout
Ohio Oil, No. 1 Ford, South Belridge, Kern	6-29-22	2,027	reaming
Texas Co., No. 2-23 Theta, Lost Hills, Kern	2-26-20	1,845	O. S. drlg.
Argo Pet., No. 1 Farnsworth, Lost Hills, Kern	11-26-20	1,284	cleaning out
Shell Oil, No. 1 Voight, Belridge, Kern	32-27-20	1,466	sd. sh. drlg.
Belridge Oil, No. 27-6 North Belridge, Kern	27-27-20	3,884	sd. sh. drlg.
Belridge Oil, No. 27-7 North Belridge, Kern	27-27-20	8,368	O. S. drlg.
Belridge Oil, No. 35-26 North Belridge, Kern	35-27-20	2,493	sd. sh. drlg.
Tide Water A. O., No. 7 Reward, North Belridge, Kern	34-27-20	8,891	O. S. drlg.
Tide Water A. O., No. 1-21 North Belridge, Kern	21-27-20	8,633	hd. sd. drlg.
Tide Water A. O., No. 2-21 North Belridge, Kern	21-27-20	8,711	O. S. drlg.
Richfield Oil, No. 1-A North Belridge, Kern	22-27-20	8,030	br. sh. drlg.
Richfield Oil, No. 2 North Belridge, Kern	22-27-20	2,463	sd. sh. drlg.
Texas Co., No. 2 Martin, North Belridge, Kern	22-27-20	8,480	flow 1,360 b.d.
Texas Co., No. 3 Martin, North Belridge, Kern	22-27-20	6,681	br. sh. drlg.
General Pet., No. 1 St. Helens, Belridge, Kern	12-28-20	8,128	fish bit
Coast Expl., No. 1 Coffee, Round Mountain, Kern	6-28-29	1,915	coring
Cal-Western Oil, No. 10 Round Mountain, Kern	12-28-28	1,836	sd. sh. drlg.
Vedder Pet., No. 2 Bell, Round Mountain, Kern	12-28-28	1,926	rig to pump
California Star Oil, No. 6-80 Kern Front, Kern	22-28-27	2,714	O. S. drlg.
Rubenstein, A. B., No. 1 Lerdo, Kern	20-28-27	3,369	P. B. 3,250
Dickey, H. B., No. 1 Kern River, Kern	34-28-28	290	rig to pump
Helm & Smith, No. 2-A Kernco, Kern River, Kern	34-28-28	359	sd. sh. drlg.
Carter, J. P., No. 2 S. P. L., Mount Poso, Kern	3-27-28	1,473	cleaning out
Bargol Oil, No. 2 Claflin, Mount Poso, Kern	10-27-27	1,818	gr. sd. drlg.
Framac Oil, No. 3 Brown, Mount Poso, Kern	22-27-27	1,351	redrlg. 1,310
Ring Oil, No. 6 Bowles, Mount Poso, Kern	29-26-28	1,785	O. S. drlg.
Western Gulf Oil, No. 33 KCL, Fruitvale, Kern	22-29-27	3,968	O. S. drlg.
Wood Callahan Oil, No. 21-2 Edison, Kern	21-30-29	3,675	P. B. 3,250
Wood Callahan Oil, No. 1 Porter, Edison, Kern	20-30-29	2,997	sd. sh. drlg.
Petrex, Inc., No. 1 Arvin, Kern	32-31-30	3,685	rig blew down
Union Oil, No. 1 Berry, Arvin, Kern	15-31-29	4,397	sd. sh. drlg.
Superior Oil, No. 1 Wagner, Rio Bravo, Kern	35-28-25	11,265	flow 750 b.d.
Superior Oil, No. 2 Wagner, Rio Bravo, Kern	35-28-25	10,140	sd. sh. drlg.
Superior Oil, No. 1 Geissinger, Rio Bravo, Kern	32-28-25	10,480	sd. sh. drlg.
Superior Oil, No. 1 Ruhl, Rio Bravo, Kern	1-29-25	10,220	sd. sh. drlg.
Union Oil, No. 2-34 KCL, Rio Bravo, Kern	34-28-25	11,090	br. sh. drlg.
Getty Oil, No 1 Ramsay, Rio Bravo, Kern	35-28-25	8,996	sd. sh. drlg.
General Pet., No. 1 Wagner, Rio Bravo, Kern	35-28-25	8,580	sd. sh. drlg.
Shell Oil, No 58-A KCL, Bellevue, Kern	29-29-27	5,678	sd. sh. drlg.
Continental Oil, No. 1-D KCL, Greeley, Kern	10-30-36	7,684	gr. sd. drlg.
Superior Oil, No. 9 KCL, Greeley, Kern	3-30-26	7,870	redrlg. 7,591
Standard Oil, No. 1 Calder Klassen, Greeley, Kern	20-29-26	7,794	P. B. 7,750
Standard Oil, No. 2 Fleishauer, Greeley, Kern	20-29-26	7,697	sd. sh. drlg.
Standard Oil, No. 11-2 KCL, Greeley, Kern	20-29-26	10,294	cleaning out
Standard Oil, No. 11-12 KCL, Greeley, Kern	20-29-26	7,902	redrlg. 7,711
Standard Oil, No. 11-13 KCL, Greeley, Kern	20-29-26	7,793	sd. sh. drlg.
Standard Oil, No. 12-4 KCL, Greeley, Kern	16-29-26	7,820	gr. sd. drlg.
Shell Oil, No. 8-29-A KCL, Ten Section, Kern	29-30-26	7,950	sd. sh. drlg.
Shell Oil, No. 41-32-B KCL, Ten Section, Kern	32-30-26	8,180	O. S. drlg.
Shell Oil, No. 52-31-B KCL, Ten Section, Kern	31-30-26	8,160	flow 315 b.d.
Shell Oil, No. 81-31-B KCL, Ten Section, Kern	31-20-26	6,990	sd. sh. drlg.
Shell Oil, No. 2-A KCL, Canal, Kern	13-30-25	3,560	sd. sh. drlg.
Ohio Oil, No. 5-E Canal, Kern	14-30-25	5,851	sd. sh. drlg.
Ohio Oil, No. 8-A KCL, Buena Vista Lake, Kern	32-31-26	8,404	sd. sh. drlg.
Richfield Oil, No. 1 M.C. Midway-Sunset, Kern	24-31-22	2,560	acidizing
C.C.M. Oil, No. 4 Tumbador, Midway-Sunset, Kern	24-31-22	2,300	sd. sh. drlg.
Berry Oil, No. 22 Midway-Sunset, Kern	28-12-24	822	sd. sh. drlg.
Chemeketa Oil, No. 1 Midway-Sunset, Kern	15-32-23	2,355	cleaning out
Standard Oil, No. 35-23-D Midway-Sunset, Kern	23-32-24	3,831	P. B. 3,550
Victor Oil, No. 14 Midway-Sunset, Kern	35-32-23	3,104	br. sh. drlg.
Formax Oil, No. 22 Midway-Sunset, Kern	36-32-23	1,793	rig to pump
Hoyt, Otis, No. 9 Sunset, Midway-Sunset, Kern	7-11-23	1,984	sd. sh. drlg.
National Oil, No. 17 Midway-Sunset, Kern	35-32-23	1,901	sd. sh. drlg.
Texas Co., No. 1 Pioneer, Midway-Sunset, Kern	33-11-23	7,280	br. sh. drlg.
Texas Co., No. 30 Midway-Sunset, Kern	32-32-24	3,245	pump 255 b.d.
Petrol Corp., No. 1 Tejon, Kern	32-11-19	6,022	idle
Universal Consd., No. 1 Tejon, Kern	33-11-19	4,634	pump 90 b.d.
Shell Oil, No. 4-26 KCL, San Emidio, Kern	26-11-22	7,670	fish D. P.
Pure Oil, No. 1 SPL, Cantua, Fresno	31-18-18	10,675	br. sh. drlg.
Superior Oil, No. C.U.P., Fresno	20-16-13	5,481	sd. sh. drlg.
Jacalitos Oil, No. 1 Jacalitos, Fresno	14-21-15	5,870	redrlg. 5,715
Pet. Sec., No. 2 Gatchell, Jacalitos, Fresno	18-20-16	6,390	gr. sh. drlg.
Shell Oil, No. 36-1 Italo, Coalinga, Fresno	36-19-14	2,564	sd. sh. drlg.
K. N. D. A., No. 67-20-J Kettleman North, Fresno	20-21-17	9,787	hd. sh. drlg.
K. N. D. A., No. 72-4-P Kettleman North, Fresno	4-22-17	7,891	hd. sh. drlg.
K. N. D. A., No. 6-6-Q Kettleman North, Kings	6-22-18	8,690	P. B. 8,189
K. N. D. A., No. 6-8-Q Kettleman North, Kings	8-22-18	6,184	br. sh. drlg.
K. N. D. A., No. 38-8-Q Kettleman North, Kings	8-22-18	5,762	hd. sh. drlg.
K. N. D. A., No. 58-16-Q Kettleman North, Kings	16-22-18	3,375	sd. sh. drlg.
K. N. D. A., No. 47-18-Q Kettleman North, Kings	16-22-18	6,482	br. sh. drlg.
Standard Oil, No. 27-21-J Kettleman North, Fresno	21-21-17	10,500	br. sh. drlg.
Standard Oil, No. 58-33-J Kettleman North, Fresno	33-21-17	6,291	br. sh. drlg.
Standard Oil, No. 2-11-P Kettleman North, Kings	11-22-17	7,850	recmtd. 7,701
Standard Oil, No. 87-1-P Kettleman North, Kings	1-22-17	6,287	sd. sh. drlg.

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
Br. sh., brown shale.
B.S., basic sediment.
Cd. or Crd., cored.
C.D., corrected depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg. or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
L.D.D., later drilled deeper.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging or plugged back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtr., or St. sidetracking.
S.D.P.L., shut down for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T.P., tubing pressure.
Tr., tract.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting for cement to set.
W.P., working pressure.
W.S.O., water shutoff.
W.S.S.O.K., water shutoff O.K.
W.S.O.N.G., water shutoff no good.
W.S.R. or W.O.S.R., awaiting standard rig.
Wtr., water.

Standard Oil, No. 21-13-P Kettleman North, Kings	13-22-17	7,284	fish D. P.
Standard Oil, No. 41-7-Q Kettleman North, Kings	7-22-18	7,295	br. sh. drlg.
Standard Oil, No. 85-7-Q Kettleman North, Kings	7-22-18	5,529	sd. sh. drlg.
Bandini Pet., No. 5 Whepley, Kettleman N., Fresno	35-21-17	9,530	sd. sh. drlg.
Pyramid Prod., No. 1 Kettleman Plains, Kings	27-24-18	2,550	idle
Standard Oil, No. 2 Weyl, McDonald Island, S. Joaquin	25- 2- 4	8,718	br. sh. drlg.
Wilshire Oil, No. 1 Cowell, Half Moon Bay, San Mateo	20- 6- 5	7,820	sd. sh. drlg.

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location and county—	S.T.R.	Depth	Status
Sovereign Oil, No. 1 El Segundo, Los Angeles	12- 3-15	7,086	sd. sh. drlg.
Termo Co., No. 2 El Segundo, Los Angeles	12- 3-15	7,400	swabbing
Wilshire Oil, No. 1 Const., El Segundo, Los Angeles	12- 3-15	7,408	fishing
Patton, C. B., No. 1 Meacham, Torrance, Los Angeles	14- 4-14	4,981	sd. sh. drlg.
Patton, C. B., No. 2 Neill, Torrance, Los Angeles	14- 4-14	3,747	will deepen
McCaslin, W. E., No. 2 Torrance, Los Angeles	14- 4-14	4,898	sd. sh. drlg.
Torrance Oil, No. 1 Grubb, Torrance, Los Angeles	14- 4-14	3,673	rigging up
Sol Oil, No. 1 Torrance, Torrance, Los Angeles	14- 4-14	3,825	cleaning out
Anderson, N. H., No. 2 Torrance, Los Angeles	14- 4-14	5,051	water witch
Anderson, N. H., No. 4 Torrance, Los Angeles	23- 4-14	5,005	pump 150 b.d.
Emerald Oil, No. 1 fee, Torrance, Los Angeles	23- 4-14	5,120	pump water
Camp, C. W., No. 1 Perkins, Torrance, Los Angeles	23- 4-14	5,037	P. B. 5,020
Camp, C. W., No. 12 Torrance, Los Angeles	23- 4-14	3,780	repair rig
Doyle Pet., No. 1 Bond, Torrance, Los Angeles	14- 4-14	4,660	sd. sh. drlg.
Doyle Pet., No. 1 Neill, Torrance, Los Angeles	14- 4-14	4,392	sd. sh. drlg.
Elyod Oil Co., No. 1 Post, Torrance, Los Angeles	14- 4-14	3,774	redrlg. 3,160
Peso Oil, No. 1 Marcoux, Torrance, Los Angeles	14- 4-14	3,782	rigging up
Wilkens & Co., No. 1 Torrance, Los Angeles	14- 4-14	3,795	rigging up
Woolner Oil, No. 5 Torrance, Los Angeles	14- 4-14	5,020	flow 200 b.d.
Krause & Baker, No. 2 Gladys, Torrance, Los Angeles	14- 4-14	3,795	rebldg. rig
Pilgrim Oil, No. 1 P. & O., Torrance, Los Angeles	14- 4-14	3,800	redrlg. 3,596
Pilgrim Oil, No. 2 Getty, Torrance, Los Angeles	14- 4-14	3,780	cleaning out
Texas Co., No. 5 Redondo, Torrance, Los Angeles	5- 4-14	3,442	redrlg. 3,198
Texas Co., No. 3 Wilson, Torrance, Los Angeles	15- 4-14	3,887	sd. sh. drlg.
McWhorter Oil, No. 2 Cook, Torrance, Los Angeles	14- 4-14	3,770	rebldg. rig
South. Cal. Drlg., No. 1 Hough, Torrance, Los Angeles	14- 4-14	3,780	will deepen
M. & M. Oil, No. 6-L Torrance, Los Angeles	22- 4-14	5,130	pump 175 b.d.
Superior Oil, No. 5 Torrance, Los Angeles	16- 4-14	4,693	sd. sh. drlg.
Imperial Gypsum, No. 1-C Torrance, Los Angeles	16- 4-14	3,750	will deepen
Lakeside Oil, No. 1 Cook, Torrance, Los Angeles	16- 4-14	3,760	cleaning out
Coast Line Oil, No. 1 McBride, Torrance, Los Angeles	16- 4-14	3,980	sd. sh. drlg.
C. C. M. O., No. 14 Torrance, Los Angeles Co.	16- 4-14	3,724	milling
C. C. M. O., No. 23 Torrance, Los Angeles Co.	16- 4-14	3,770	will deepen
Fisher, N., No. 1 Watkins, Torrance, Los Angeles	23- 4-14	5,150	rig to pump
Fisher, N., No. 1 Washburn, Torrance, Los Angeles	16- 4-14	5,175	sd. sh. drlg.
Berken Oil, No. 1 Star, Torrance, Los Angeles	16- 4-14	3,758	rigging up
Union Oil, No. 49 Hellman, Dominguez, Los Angeles	33- 3-13	6,393	pump 160 b.d.
Union Oil, No. 58 Callender, Dominguez, los Angeles	33- 3-13	6,573	sd. sh. drlg.
Union Oil, No. 59 Callender, Dominguez, Los Angeles	33- 3-13	5,650	sd. sh. drlg.
Union Oil, No. 60 Callender, Dominguez, Los Angeles	33- 3-13	5,694	sd. sh. drlg.
Barnsdall Oil, No. 20 O'Dea, Rosecrans, Los Angeles	18- 3-13	5,291	sd. sh. drlg.
Union Oil, No. 18-R Rosecrans, Los Angeles	18- 3-13	7,630	cmtd. 7,300
Universal Consd., No. 2 Trust, Rosecrans, Los Angeles	18- 3-13	5,798	sd. sh. drlg.
Towsley Canyon Oil, No. 1 Newhall, Los Angeles	8- 3-15	4,105	idle
Royal Lands, No. 1 Ramona, Castaic, Los Angeles	8- 4-17	366	idle
General Pet., No. 36 Ford, Wilmington, Los Angeles	4- 5-13	2,597	sd. sh. drlg.
General Pet., No. 39 Ford, Wilmington, Los Angeles	4- 5-13	2,450	sd. sh. drlg.
General Pet., No. 3-1 C.C., Wilmington, Los Angeles	4- 5-13	2,599	sd. sh. drlg.
General Pet., No. 3-5 C.C., Wilmington, Los Angeles	2- 5-13	3,310	O. S. drlg.
General Pet., No. 5 Harbor, Wilmington, Los Angeles	2- 5-13	3,900	O. S. drlg.
General Pet., No. 9 Harbor, Wilmington, Los Angeles	2- 5-13	3,025	sd. sh. drlg.
General Pet., No. 4-S.P., Wilmington, Los Angeles	2- 5-13	2,685	O. S. drlg.
Allied Pet., No. 27 Wilmington, Los Angeles	32- 4-13	2,098	sd. sh. drlg.
Bankline Oil, No. 3-U.P., Wilmington, Los Angeles	3- 5-13	2,413	cmtd.
Bankline Oil, No. 5-U.P., Wilmington, Los Angeles	2- 5-13	3,888	flow 5,750 b.d.
Baker Oil, No. 1 Wilmington, Los Angeles	35- 4-13	3,078	cmtd. 3,077
Caminol Co., No. 2-7-H Wilmington, Los Angeles	2- 5-13	2,750	sd. sh. drlg.
Dunlap Oil, No. 11 Wilmington, Los Angeles	2- 5-13	1,987	sd. sh. drlg.
Hogan Pet., No. 1 Graham, Wilmington, Los Angeles	2- 5-13	2,700	sd. sh. drlg.
Hancock Oil, No. 3-A Wilmington, Los Angeles	2- 5-13	3,369	sd. sh. drlg.
Hancock Oil, No. 5-A Wilmington, Los Angeles	2- 5-13	2,398	sd. sh. drlg.
Hancock Oil, No. 6-E Wilmington, Los Angeles	2- 5-13	3,754	O. S. drlg.
L. B. Harbor Oil, No. 2-CC, Wilmington, Los Angeles	2- 5-13	3,475	O. S. drlg.
Pongratz, Gus, No. 2-A Wilmington, Los Angeles	32- 4-13	3,674	flow 685 b.d.
Pongratz, Gus, No. 2-G Wilmington, Los Angeles	32- 4-13	3,659	flow 598 b.d.
Richfield Oil, No. 1-G Wilmington, Los Angeles	2- 5-13	5,960	sd. sh. drlg.
Richfield Oil, No. 2-R.O., Wilmington, Los Angeles	2- 5-13	2,754	sd. sh. drlg.
Richfield Oil, No. 4-P.G., Wilmington, Los Angeles	2- 5-13	2,146	sd. sh. drlg.
Richfield Oil, No. 1-W.E., Wilmington, Los Angeles	2- 5-13	1,967	sd. sh. drlg.
Royalty Service, No. 6 Nelson, Wilmington, Los A.	2- 5-13	2,098	sd. sh. drlg.
Superior Oil, No. 3 B.B., Wilmington, Los Angeles	4- 5-13	1,997	sd. sh. drlg.
Texas Co., No. 2 Ref., Wilmington, Los Angeles	32- 4-13	3,472	sd. sh. drlg.
Termo Co., No. 1-D Wilmington, Los Angeles	4- 5-13	2,146	sd. sh. drlg.
Termo Co., No. 2-D Wilmington, Los Angeles Co.	4- 5-13	2,178	sd. sh. drlg.
Union Pacific R.R., No. 48 Wilmington, Los Angeles	33- 4-13	2,968	flow 1,435 b.d.
Union Pacific R.R., No. 49 Wilmington, Los Angeles	34- 4-13	3,982	flow 8,254 b.d.
Union Pacific R.R., No. 50 Wilmington, Los Angeles	34- 4-13	1,998	sd. sh. drlg.
Union Pacific R.R., No. 51 Wilmington, Los Angeles	34- 4-13	3,565	O. S. drlg.
Union Pacific R.R., No. 70 Wilmington, Los Angeles	34- 4-13	3,624	O. S. drlg.
Union Pacific R.R., No. 71 Wilmington, Los Angeles	34- 4-13	3,460	O. S. drlg.
Union Pacific R.R., No. 72 Wilmington, Los Angeles	34- 4-13	3,256	O. S. drlg.
Universal Consd., No. 2 Newport, Wilmington, Los A.	2- 5-13	3,356	sd. sh. drlg.
W. G. Oil, No. 1-A LBHD, Wilmington, Los Angeles	3- 5-13	3,570	sd. sh. drlg.
W. G. Oil, No. 2-A LBHD, Wilmington, Los Angeles	3- 5-13	3,576	sd. sh. drlg.
W. G. Oil, No. 3-A LBHD, Wilmington, Los Angeles	3- 5-13	3,885	O. S. drlg.
W. G. Oil, No. 4-A LBHD, Wilmington, Los Angeles	3- 5-13	3,885	O. S. drlg.
Johnston Drlg., No. 1 Pico, Montebello, Los Angeles	5- 2-11	3,574	sd. sh. drlg.
St. Helens Pet., No. 24-M Montebello, Los Angeles	2 2-12	4,981	sd. sh. drlg.
St. Helens Pet., No. 25-M Montebello, Los Angeles	2- 2-12	2,863	sd. sh. drlg.
Union Oil, No. 1 Howard, Montebello, Los Angeles	2- 2-12	3,064	sd. sh. drlg.
McVicar & Rood, No. 1 Manz, Montebello, Los Angeles	2- 2-12	3,729	cmtd. 3,010
Hilldon Oil, No. 2 North Long Beach, Los Angeles	13- 4-13	4,085	O. S. drlg.
Abrams, John, No. 1 Flood Control, Los Angeles	13- 4-13	4,632	idle
Kramildon Oil, No. 1 Long Beach, Los Angeles	13- 4-13	4,510	sd. sh. drlg.
Marvell Oil, No. 1 Long Beach, Los Angeles	19- 4-12	1,392	sd. sh. drlg.
Powers, E. D., No. 3 Long Beach, Los Angeles	20- 4-12	4,303	pump water
Signal Oil, No. 1 P.E., Long Beach, Los Angeles	19- 4-12	1,984	sd. sh. drlg.
Sunset Oil, No. 1 Whitney, Long Beach, Los Angeles	19- 4-12	3,092	pump 168 b.d.
Shell Oil, No. 1 Goddard, Long Beach, Los Angeles	19- 4-12	3,520	cmtd. 3,518
Richfield Oil, No. 4-B Long Beach, Los Angeles	13- 4-13	4,130	sd. sh. drlg.
Yunker, C. F., No. 2 Barbara, Long Beach, Los A.	19- 4-12	1,198	sd. sh. drlg.
Union Oil, No. 100 Santa Fe Springs, Los Angeles	6- 3-11	9,945	flow O. & W.
W. P. R. Oil, No. 3 Huntington, Orange	35- 5-11	6,935	rig to pump
Brea Canyon Oil, No. 48 Brea Canyon, Orange	2- 3-10	1,202	hd. sh. drlg.
Standard Oil, No. 127 Murphy, West Coyote, Orange	18- 3-10	3,240	cmtd. 3,224
Standard Oil, No. 2 Bastanchury, W. Coyote, Orange	24- 3-11	2,874	sd. sh. drlg.
Standard Oil, No. 2-26 Kraemer, Richfield, Orange	32- 3- 9	4,395	O. S. drlg.
Pearl, J., Oil Co., No. 1 Dobashi, Yorba, Orange	21- 3- 9	1,205	sd. sh. drlg.
Oliver & Owen, No. 1 Anderson, Yorba, Orange	22- 3- 9	1,221	sd. sh. drlg.
Beth Pet., No. 1 Pickering, Yorba, Orange	22- 3- 9	2,311	rig to pump
Brown & Co., No. 1 Hurley, Yorba, Orange	22- 3- 9	1,427	sd. sh. drlg.
Selegna Oil, No. 1-A Chino, San Bernardino	12- 3- 8	3,159	dry; abd.

OKLAHOMA

Week Ending March 12

NORTHERN OKLAHOMA

Beckham County

Mid-American Oil Co. No. 1-A Biscoe, SW cor. sec. 28-8-22w. Drlg. 2,692 ft.

Cleveland County

W. A. Delaney et al No. 1 Bugher, SE SE SW sec. 12-7-2w. Rig.

Harper-Turner No. 1 Pollock, C W½ NW NW sec. 13-9-2w. T.D. 7,590 ft.; D.&A.

Comanche County

Clyde Roach No. 1-A Green, SE SE SW sec. 2-1n-13w. Drlg. 590 ft.

Creek County

M. W. Mosier et al No. 1 Holcomb, SE SW NW sec. 19-18-8. T.D. 3,018 ft.; 2,000 ft. W.I.H. and S.S.O.; S.D.

Garfield County

H. R. Hollenback et al No. 1 Clark, NW cor. sec. 34-21-6w. Second Wilcox 7,298 ft.; T.D. 7,336 ft.; flwd. 294 bbls. in 19 hrs.; gas 1,053,000 ft.; 98 shots 7,259-80 ft.; head flow 408 B.O. in 24 hrs.; to acidize.

Garvin County

B. C. D. Edwards No. 1 Clark, NE cor. sec. 16-3n-3e. T.D. 2,676 ft.; P.B. 2,088 ft.; perf.; swb. 6 bbls. fluid in 1 hr.; est. half wtr.; R.U.S.T.

Grady County

Doyle Pet. Co. No. 1 Huffine, NW NW SE sec. 30-5-8w. Drlg.

Gulf Oil Corp. No. 1 Thomas, SW NW NW sec. 14-4-5w. Drlg. 11,072 ft.

Greer County

J. A. Everitt No. 1 Graumann, NE NW NW sec. 11-5-21w. T.D. 140 ft.; S.D.

R. W. McDonald No. 1 Fite, SE SE sec. 34-7-21w. Drlg. 1,075 ft.

J. I. Medlin et al No. 1 Broudie, NW cor. sec. 5-6n-20w. T.D. 90 ft.; (cor.); S.D.

Hughes County

Amerada Pet. Corp. and Stanolind O. & G. Co. No. 1 Preame, NW NW SE sec. 29-9-9. Drlg. 3,372 ft.

Homer Doup et al No. 1 Bank, NE NE NW sec. 7-7-9. S.D. 335 ft.

E. H. Moore et al No. 1 Hunter, NE NE NW sec. 30-4-9. Drlg. 2,248 ft.

Phillaine Oil Co. No. 1 Morrison, SE SE SW sec. 13-9-10. T.D. 150 ft.; R.U.R.

Phillips Pet. Co. No. 1 Becker, NE NW SW sec. 8-5-10. T.D. 6,286 ft.; P.B. 5,760 ft.; plug at 5,780 ft.; 5,000 ft. O.I.H.

Troup & Strickland No. 1 Brown, NW SW NE sec. 32-6-8. Set 7-in. csg. 660 ft.; W.O.C.

Kay County

F. S. Freeland et al No. 1-A Watson, NE NW NW sec. 28-28-1w. Rig on ground.

J. R. Pierse No. 1 Hannon, SE cor. sec. 26-28-2e. Drlg. 1,550 ft.

E. J. Shaffer et al No. 1 McKee, NE NW sec. 20-28-1w. T.D. 2,500 ft.; S.D.

Kiowa County

Gauntt & Baker No. 1 Parks, NW NW SW sec. 29-7-20w. S.D. 720 ft.

Hughes & Reese No. 1 Fultz, SE cor. sec. 10-6-18w. T.D. 1,238 ft.; S.D.

Lincoln County

Stanolind O. & G. Co. and Amerada Pet. Corp. No. 1 Strader, NW NW NE sec. 18-13-3e. Drlg. 5,005 ft.

Wilcox O. & G. Co. No. 1 Evans, SW SW NW sec. 21-14-6. R.U.R.

Wilcox O. & G. Co. No. 1 Royer, SE SE NE sec. 18-14-6. T.D. 3,372 ft.; shot; C.O.

Logan County

Arrow Drlg. Co. No. 1 Dodson, NW cor. sec. 23-17-1w. T.D. 5,385 ft.; D.&A.

Carter Oil Co. No. 1 Lydick, C E½ NW NE sec. 23-15-4w. Drlg. 2,040 ft.

Stanolind O. & G. Co. No. 1 Blunt B, C W½ W½ NW sec. 6-14-3w. T.D. 6,495 ft.; D.&A.

Muskogee County

H. H. Heydrick No. 1 Bolby, C NE sec. 22-13-19. Drlg. 630 ft.

Osage County

Norbia Oil Co. and Carter Oil Co. No. 1 Osage, NW cor. sec. 3-24-6. T.D. 2,839 ft.; D.&A.

Payne County

Big Chief Drlg. Co. et al No. 1 Moore, SE SW NW sec. 17-18-1e. Drlg. 2,650 ft.

Heimerich & Payne No. 1 Ritchie, C NE NW sec. 34-18-1e. T.D. 5,353 ft.; D.&A.

Pontotoc County

Cowley et al No. 1 McCormick, NW SW SW SE sec. 27-2n-4e. Drlg. 272 ft.

H. W. Lee No. 1 Weatherly, NW SE NW sec. 24-1n-7. Set 12½-in. csg. 243 ft.; S.D. 280 ft.

Jack Lynch et al No. 1-A Parker, SW SW SE sec. 17-4-8. T.D. 1,550 ft.; S.D.

Union Dev. Co. No. 1 Abbott, SW NW NE sec. 34-3-6. T.D. 3,320 ft.; fsg.

Pottawatomie County

Hall & O'Mara No. 1 Shaw, NE NE SE sec. 32-6-5. Set 7-in. 2,350 ft.; T.D. 3,346 ft.; W.O.C.

Seminole County

C. E. Davis et al No. 1 Jones, NW NE SW sec. 34-6-5. T.D. 2,314 ft.; P.B. and S.O.&G.

W. B. Pine No. 1 Wright, SE SE NE sec. 16-6-6. Drlg. 2,605 ft.

Sunshine Oil Co. No. 1 Ferguson, SE SW NE sec. 7-7-8. T.D. 4,421 ft.

H. V. Woodson and Marydun Oil Co. No. 1 Gilliland, SE SW sec. 24-11-7. T.D. 4,295 ft.; to drill to Wilcox.

Texas County

Hagey et al No. 1 Peck, C NE sec. 6-1n-13ecm. T.D. 2,842 ft.; csg. collapsed; S.D.

Harkendorf & Kuhn No. 1 Wiggins, C NW sec. 1-2n-14ecm. T.D. 2,510 ft.; R.U.S.T.

Washita County

L. B. McWhirter No. 1 fee, NW SW SW sec. 34-8-19w. T.D. 2,037 ft.; S.D.

SOUTHERN OKLAHOMA

Atoka County

Amerada Pet. Corp. and Stanolind O. & G. Co. No. 1 Ridgway, NE cor. sec. 24-3s-9. Set 8-in. 2,730 ft.; T.D. 2,757 ft.; W.O.C.

C. M. Sheldon and Gardner Pet. Co. No. 1 Lee, NE NW SW sec. 2-4s-10e. S.D. 2,416 ft.

Bryan County

Southern Oil Co. No. 1 Henry, NW NW NE sec. 10-8s-7. T.D. 5,003 ft.; S.D.O.

Carter County

Texas Co. No. 1-B Cathey, SE NE NE sec. 6-5s-1w. T.D. 4,559 ft.; pulled 7-in. csg.; C.O.

Choctaw County

V. K. Chapman and T. N. Low No. 1 Hallum, NE NW NW sec. 4-7s-20. Drlg. 700 ft.

Cotton County

Jim Turner et al No. 1-A Collins, SW NE NE sec. 18-4s-10w. T.D. 1,305 ft.; abd.

Johnston County

W. T. Sheldon No. 1 Chapman, C NW NW sec. 26-4s-6e. T.D. 3,176 ft.; S.D.

Love County

Sinclair Prairie Oil Co. No. 1 Peabody, NE cor. sec. 35-6s-2w. Drlg. sh. 3,177 ft.

Stephens County

Coline Oil Co. No. 1 Johnson, C SW SE SE NE sec. 1-2n-8w. T.D. 10,000 ft.; P.B. and drld. to 9,086 ft.; fsg. for cones.

Heimerich & Payne No. 1 Mauersberger, C S½ SW SE sec. 29-2n-8w. Drlg. 4,142 ft.

Tillman County

Gibson & Jennings No. 1 Burleson, SE SE SW sec. 35-2s-19w. Drlg. 1,585 ft.

H. I. Grimes et al No. 1 Laney, NW cor. sec. 3-3s-18w. T.D. 4,020 ft.; abd.

M. G. Martin No. 1 Parris, NW NW SW sec. 3-3s-19w. Drlg. sh. 2,930 ft.

Smith No. 2 Hammell, NE NW NW sec. 6-5s-15w. T.D. 1,581 ft.; S.D.

KANSAS

Week Ending March 12 (Descriptions are East unless marked otherwise)

Barber County

Carter Oil Co. et al No. 1 Ely, C NE NW sec. 6-32-14w. Drlg. 4,515 ft.

Palmer Oil Corp. et al No. 1 Warwick, C NW sec. 29-31-10w. Drlg. 4,600 ft.

Barton County

Crown Oil Co. No. 1 Schartz, NW sec. 7-20-11w. U.R. 10-in. 2,220 ft.

R. E. Day et al No. 1 Felts, SE SE NE sec. 14-16-12w. S.D. 1,875 ft.

Martin & Foraker et al No. 1 Dick Est., NE SW SW sec. 31-19-11w. Abd.
Murfin et al No. No. 1 Rexroot, NW SE sec. 14-17-13w. Spd.
C. L. Price No. 1 Hammeke, NE NE SW sec. 12-18-12w. Sil. 3,415-27 ft.; T.D. 3,433 ft.; P.B. 3,429 ft.; est. 20 B.O. P.D. and 2 B.W.
Price et al No. 1 Wondra, NW NE sec. 10-17-13w. Drlg. 330 ft.
Sinclair Prairie Oil Co. No. 1 Frederick, SW SW SE sec. 16-16-11w. Drlg. 2,863 ft.

Butler County

T. S. Dustin No. 1 Miley, SE NW NE sec. 17-27-5e. S.D. 810 ft.
Saco Oil Co. et al No. 1 Pettit, SW NW SW sec. 21-28-6. Drlg. 1,150 ft.
Steinbuchel et al No. 1 Fox, NW SE NE sec. 25-26-3e. T.D. 1,010 ft.; abd.

Chase County

T. D. Duffy No. 1 Leedy, NE NW NW sec. 26-22-9. S.D. 1,515 ft.

Clark County

Olson Oil Co. et al No. 1 Watkins, SW NW sec. 23-32-21w. Drlg. 7,136 ft.

Cowley County

Bess & Gralapp et al No. 1 Hunt, CNL NE NW sec. 18-34-5e. Spd.
Arthur Brewer No. 1 Clark, NE SE NW sec. 6-31-4. Bville. 2,860-70 ft.; T.D. 2,874 ft.; swb. 28 B.O. in 8 hrs.
Arthur Brewer No. 1 McDaniels, SW cor. sec. 24-30-4e. Spd.
Tom Palmer No. 1 Neimaller, NE cor. sec. 14-30-4e. T.D. 2,962 ft.; D.&A.
Earl Wakefield No. 1 White, NW NE sec. 4-33-4e. Drlg. 1,953 ft.

Ellis County

Carter Oil Co. No. 1 Foster, SE NW sec. 1-15-16w. Drlg. 2,085 ft.
Colonial Oil Co., Trott et al No. 1 Hadley, SE NE SE sec. 12-11-8w. T.D. 3,146 ft.; drlg. cmt.
Hays & Sackrider No. 1 Windholtz, NE cor. sec. 2-13-16w. T.D. 3,162 ft.; set 6-in. 3,124 ft.; C.O.
Twin Drlg. Co. et al No. 1 Hall, NW SW NE sec. 1-12-17w. Drlg. 1,850 ft.

Ellsworth County

Colonial Oil Co. No. 1 Hagy, NW cor. sec. 16-16-10w. Arb. 3,344-58 ft.; acd; pmpd. 302 B.O. in 5 hrs.
Ralph Wixson et al No. 1 Peterman, SW cor. sec. 28-17-10w. T.D. 3,306 ft.; 2,500 ft. F.I.H. after 18 days.

Finney County

Atlantic Ref. Co. No. 1 Nunn, C SE NE sec. 27-21-34w. Drlg. 3,040 ft.

Graham County

Continental Oil Co. and Cities Service Oil Co. No. 1 Morel, C W½ E½ NE sec. 15-9-21w. Drlg. 2,323 ft.

Greenwood County

Landon & Mendenhall No. 1 Slough, NE SW sec. 9-24-13e. Drlg. 1,890 ft.
C. C. Whitaker et al No. 1 Bressner, NW SE sec. 8-26-13e. Drlg. 600 ft.

Harper County

Franklin Drlg. Co. No. 1 Waits, NE SW sec. 24-34-6w. Drlg. 4,300 ft.

Jewell County

Hollingsworth Bros. No. 1 Wolfe, NE SW SE sec. 14-4s-8w. S.D. 100 ft.

Lane County

Phillips Pet. Co. No. 1 Kees, C SE SE sec. 3-19-30w. T.D. 4,911 ft.; W.O.C.

McPherson County

Archer & Crane No. 1 Templin, NW SW SE sec. 32-17-3w. Arb. 3,632 ft.; T.D. 3,652 ft.; D.&A.
Darrah et al No. 1 Decker, SW SW SE sec. 12-21-2w. T.D. 2,985 ft.; drlg. cmt.

Meade County

Barnett et al No. 1 Adams, NW SE sec. 22-34-30w. S.D. 69 ft.
Bryan & West No. 1 Brown, NE SW sec. 5-33-27w. Spd. and S.D.

Ness County

Marshall Drlg. Co. et al No. 1 Anderson, SW NW sec. 23-16-24w. Spd. and S.D.
Trojan O. & G. Co. No. 1 Moses, C SW NW sec. 10-18-25w. S.D. 500 ft.
Trojan O. & G. Co. No. 1 Page Milling Co. SE SE NW sec. 36-18-26w. C.O. 3,265 ft.

Phillips County

C. W. Davidson et al No. 1 Elliff, SE NE NE sec. 35-5-18w. S.D. 600 ft.

Pratt County

Cities Service Oil Co. No. 1 Delaney, CNL S½ NE sec. 13-26-12w. Drlg. 4,070 ft.

Reno County

Amerada Pet. Corp. and Westgate-Greenland Oil Co. No. 1 Johns, SE cor. sec. 25-22-5w. Drlg. 1,570 ft.
Carey et al No. 1 McPheeters, NE NW sec. 22-26-8w. S.R. 3,665 ft.
Cities Service Oil Co. No. 1 Krele, C NW sec. 27-23-10w. T.D. 4,005 ft.; set 7-in. 3,894 ft.
McCole et al No. 1 Mathews, SW NW NW sec. 15-24-10w. Drlg. 2,865 ft.

Rice County

Price et al No. 1 Gemeinhardt, NE SE sec. 18-18-10w. T.D. 3,305 ft.; P.B. 3,298 ft.; pmpd. 14 B.O. in 7 hrs.
Sam Schneider et al No. 1 Sterling College, SE SW SE sec. 28-20-8w. S.O. 3,425-30 ft.; rng. 5-in. 3,460 ft.

Rooks County

Duwe & Farris No. 1 Hancock, NW SW SW sec. 21-10-18w. T.D. 3,709 ft.
Elwell et al No. 1 Zimmerman, NE NW sec. 15-9-18w. Simp. 3,720 ft.; T.D. 3,760 ft.; D.&A.
Graham et al No. 1 Fike, SW cor. sec. 9-9-17w. C.O. 3,384 ft.
Producers Oil Co. No. 1 Ham, SW SW NW sec. 25-7-19w. Set 12-in. 312 ft. (cor.); S.D. 330 ft.

Rush County

Duwe & Brouk No. 1 Lebsack, SE SE NE sec. 13-16-16w. Sil. 3,492-95 ft.; 1,500 ft. sulfur water in hole in 2½ hrs.; T.D. 3,512 ft.; S.D.O.

Russell County

Emrichs et al No. 1 Anderson, NE SE SW sec. 33-15-11w. Spd. and abd.
Hess et al No. 1 Reinhardt, NE SW sec. 36-12-14w. Arb. 3,140 ft.; T.D. 3,165 ft.; D.&A.
Jones & Shelbourne et al No. 1 Kuhnle, SE NW sec. 4-15-12w. Drlg. 2,030 ft.
Parks et al No. 1 Gorham Est., SW NW sec. 19-15-15w. Drlg. 2,025 ft.
Simpson et al No. 1 Boxberger, NE SE NW sec. 10-15-14w. Drlg. 1,940 ft.
G. A. Stearns et al No. 1 Stielow, NW cor. sec. 32-11-14w. S.D. 2,254 ft.
Winkler & Koch No. 1 Jones, SE SE NW sec. 22-14-13w. Sil. 3,180 ft.; S.D.O.

Sedgwick County

Frank Hudson et al No. 1 Fulton, NE SE sec. 35-28-1e. S.D. 1,738 ft.
McKnab No. 1 Garrett, SE SW SW sec. 18-29-2e. U.R. at 2,756 ft.
Union O. & R. Co. et al No. 1 Howell, SW cor. sec. 6-29-1e. Set 10-in. 2,298 ft.; W.O.C. 2,410 ft.

Stafford County

Cardinal Oil Co. et al No. 1 Sittner, SW cor. sec. 4-22-12w. T.D. 3,700 ft.; D. &A.
Continental Oil Co. et al No. 1 Fair, CNL SW sec. 12-25-13w. Drlg. 2,600 ft.
Fain Drlg. Co. et al No. 1 Hughes, SE sec. 13-23-12w. Drlg. 3,150 ft.
National Ref. Co. No. 1 Bonham, SW SE sec. 28-25-12w. H.F.W. 4,067-75 ft.; U.R.
Fred Rust et al No. 1 Krankenberg, SW cor. sec. 20-22-12w. Drlg. 3,260 ft.
Stanolind O. & G. Co. No. 1 Hahn, NE NW sec. 14-22-13w. Pay 3,759-63 ft.; T.D.; 3,400 ft. O.I.H.

Sumner County

Cities Service Oil Co. No. 1 McCoy, SE SW sec. 11-35-2e. Drlg. 3,690 ft.
Saco Oil Co. No. 1 Phipps, SW SE NE sec. 24-30-1w. Spd. and abd.
E. B. Shawver No. 1 Stewart, NW SE sec. 4-32-3w. T.D. 4,569 ft.; D.&A.

Trego County

Carlock No. 1 Kinzel, SW SW sec. 9-13-22w. Spd. and S.D.
Manning & Martin No. 1 Lynd, NW SW sec. 16-11-21w. Drlg. 2,891 ft.

Woodson County

Union O. & R. Co. No. 1 Laidlow, CEL NW SW sec. 35-25-15e. Miss. 1,397-1,400 ft.; ½ B.O.P.H.

Little River County

Heenan & Coe No. 1 Waldrop, SE NW sec. 21-12-28. S.D. 1,960 ft.
Joe G. Strahan et al No. 2 Dierks Lbr. Co. Drlg. sh.&L. 2,305 ft.

Miller County—Rodessa

Burden & Cummings No. 1 Treadway, sec. 10-20-28. Drlg. 1,825 ft.
G. C. Grasty No. 1 Mitchell, NW sec. 11-20-28. Set 7-in. csg. 6,155 ft.; comp.; 527 B.P.D.; ½-in. ck.; T.D. 6,165 ft.
Gulf Oil Corp. No. 1 Hanner, SE cor. sec. 16-20-24. T.D. 6,020 ft.; set 7-in. csg. 5,926 ft.
R. Lacy No. 2 Grogan, E½ W½ sec. 15-20-28. Drlg. L.&anhy. 5,500 ft.
W. M. Layton No. 1 McKellar, SE cor. W½ W½ sec. 15-20-28. Set 5½-in. csg. 5,938 ft.; T.D. 6,062 ft.
McClanahan & Feazel No. 2 Eason, C N½ NW SW sec. 12-20-28. Cg. 6,025 ft.
R. W. Newell No. 1 Thomas, NW SE sec. 12-20-28. Set 5½-in. csg. 6,130 ft.; T.D. 6,144 ft.; perf. Hill sd. 5,964-6,015 ft.; closed in; hole ½ full oil.
Texas Canadian Oil Corp. No. 2 Thomas, NE cor. NW SE sec. 12-20-28. Cg. 6,180 ft.
Mrs. S. O. Thompson No. 1 Concord Methodist Church, NE cor. SE NE sec. 10-20-28. T.D. 2,125 ft.; set 9⅝-in. csg.; W.O.C. 2,100 ft.

Ouachita County

Copenhaven Oil Corp. No. 1 Evans, NE **cor. NE SW sec. 20-11-19. S.D. 1,825 ft.**
A. H. Tarver et al No. 1 Guy Smith, sec. 16-14-19. Tokio sd. 2,186-2,210 ft.; T.D. 2,331 ft.; W.O.

Pulaski County

A. L. Kitselman, No. 2 A. L. Kitselman Jr., SE SE SW sec. 2-1s-13e. S.D.; very hd. rk. 2,400 ft.

Union County—Shuler

Alice Sydney Oil Co. No. 1 Powledge, SE cor. SW SE sec. O.W.W.O.; old T.D. 6,005 ft.; drlg. red sdy. sh. 6,901 ft.
E. M. Jones No. 3 Marine Oil Co., NE NW SE sec. 17-18-17. R.U.
E. M. Jones et al No. 2-A Murphy, sec. 19-18-17. Drlg. 1,122 ft.
Lion Oil Ref. Co. No. 2 Marine Oil Co SW cor. E½ SE¼ sec. 17-18-17. Drlg. red sdy. sh. 6,573 ft.
Lion Oil Ref. Co. No. 1 Mayfield, SE cor. Lot 3, Fract. NW¼ sec. 18-18-17. Set 10-in. csg. 2,295 ft.; T.D. 4,310 ft.; W.O.C.
Lion Oil Ref. Co. No. 1 Miller, SW cor. NE NW sec. 18-18-17. Drlg. red sdy. sh. 6,741 ft.
Lion Oil Ref. Co. No. 4-A Edna Morgan, NW cor. Lot 1, SW sec. 18-18-17. T.D. 6,279 ft.; fsg. 4-in. D.S.
Lion Oil Ref. Co. No. 5-B Morgan, SE cor. W½ SE sec. 18-18-17. Jones sd. 7,522-92 ft.; top L. 7,620 ft.; set 7-in. csg. 76,20 ft.; T.D. 7,625 ft.
Lion Oil Ref. Co. No. 2-C D. S. and J. C. Morgan, SW cor. SE SE sec. 18-18-17. Drlg. red and gray sh. 5,651 ft.
Lion Oil Ref. Co. No. 5-A E. Morgan, NE cor. Lot 7, SW sec. 18-18-17. Drlg. red and gray sh. 5,600 ft.
Marine Oil Co. No. 4 fee, NW cor. SW SW sec. 17-18-17. Drlg. sdy. sh. 7,387 ft.
Marine Oil Co. No. 3 Justiss, NE cor. Lot 7, NW sec. 18-18-17. Drlg. red sdy. sh. 6,924 ft.
Marine Oil Co. No. 1 Miller, SE cor. Lot 1, NW sec. 18-18-17. Drlg. red and gry. sh. 5,518 ft.
Phillips Pet. Co. No. 4 Justiss, Lot 6, sec. 18-18-17. Drlg. sdy. sh. 2,300 ft.
Phillips Pet. Co. No. 1 Marine Oil Co., NE cor. NW NE sec. 20-18-17. Top Jones sd. 7,527 ft.; cg. ahead 7,545 ft.
Phillips Pet. Co. No. 2 Marine, NE cor. NW NE sec. 20-18-17. Set 16-in. 180 ft.; W.O.C.
Phillips Pet. Co. No. 2 Rosen, SE cor. SW NE sec. 18-18-17. Top Jones sd. 7,531 ft.; cg. ahead 7,554 ft.
Texas Canadian Oil Corp. No. 1 Powledge, C NE NW NW sec. 21-18-17. Drlg. red and gr. sh. 4,700 ft.

Union County—Other

Ark. Southern Oil Corp. No. 2-A Simmons, SW cor. NE NW sec. 15-18-13. T.D. 2,307 ft.; O.I.H.; W.O.S.R.
E. G. Bradham No. 1 S. L. Robbins, SW cor. SW NE sec. 12-19-16. S.D. sdy. sh. 2,300 ft.
Penn-Ark. Pet. Corp. No. 1 Raulston, sec. **12-17-14. T.D. 3,175 ft.; S.D.; litigation.**
W. D. Wingfield, Tr. No. 2 Kidd Est., SE cor. NW SW sec. 15-18-13. Sd. S.D. 2,257-2,300 ft.; set 6-in. csg. 2,250 ft.; T.D. 2,300 ft.; bailing to test.

ARKANSAS

Bradley County

Phillips Pet. Co. No. 1 Marsden, sec. 9-16w-11s. Drk.

Cleveland County

J. T. Markwick and E. O. Olds No. 1 A. Vance, NW cor. NW sec. 18-11-11. S.D. 2,910 ft.; W.O.

Columbia County

Kerr-Lynn Oil Co. No. 1 Barnett, sec. 14-17-20. T.D. 7,740 ft.; set 7-in. csg. 7,052 ft.; set 723 ft. of 5-in. csg. at 7,720 ft.; perf. 7,623-51 ft.; swbd. in oil and w. wtr.; cleaned for 15 min.; killed to repair csg. connection.
Standard Oil Co. of La. No. 1 Bodcaw-Barbara, NE cor. SE NW sec. 18-16-22. T.D. 7,226 ft.; fsg.
Standard Oil Co. of La. No. 1 S. T. Crone, NW cor. NW SE sec. 8-16-22. Cg. red sh. and anhy. 7,192 ft.
Standard Oil Co. of La. No. 1 W. P. Phillips et al, 660 ft. N and W. C sec. 15-17-19. Cg. sh.&strks. L. 4,030 ft.

Crittendon County

Manning & Martin No. 1 Cartwright, SW cor. sec. 16-7n-8e. S.D. 4,200 ft.

Desha County

Columbian Fuel Corp. No. 1 Cross, SW cor. sec. 34-8s-3w. R.U.

Hempstead County

H. D. Easton et al No. 1 LaGrone, sec. 5-12-26. T.D. 2,940 ft.; P.B. 1,007 ft.; drlg. sdtrkd. hole 1,620 ft.

Lincoln County

Fitzwater, Inc., No. 1 Owens, sec. 26-9s-8w. Drld. to 1,130 ft.; S.D.

LOUISIANA

NORTH LOUISIANA PROVEN

Caddo—Rodessa

J. S. Rushing No. 2 Alexander, NW cor. sec. 3-23-16. Drlg. 5,382 ft.
Shell Pet. Corp. No. 1-B Govt., SE cor. SW SE sec. 3-23-16. Drlg. sh.&anhy. 5,503 ft.
Shell Pet. Corp. No. 2-B U. S. Govt., SE cor. sec. 3-23-16. Set 9⅝-in. csg. 2,052 ft.; W.O.C.
Standard Oil Co. of La. No. 1 Rodessa Oil & Ld. Co., NE cor. NE NE sec. 10-23-16. Set 7-in. csg. 5,928 ft.; T.D. 5,968 ft.; comp.; 455 B.P.D.; 25/64-in. ck.
Standard Oil Co. of La. No. 2 Spearman, SE cor. SE SE sec. 3-23-16. Cg. L. 5,900 ft.
Union Prod. Co. No. 7 Harris, NW cor. NE sec. 10-23-16. T.D. 5,950 ft.; set 7-in. csg. 5,934 ft.; comp.; 210 B.P.D.; 18/64-in. ck.
Williams & Long No. 1 Stiles, sec. 20-21-16. Drlg. sh. 365 ft.

N. LOUISIANA WILDCATS

Bienville Parish

Gulf Ref. Co. No. 1 Goodpine, sec. 25-14-8. Cg. sdy. sh. 8,823 ft.
Producers O. & G. Co. No. 1 Locke, NE cor. sec. 9-15-10. O.W.W.O.; old T.D. 2,960 ft.; R.U. to deepen.

Bossier Parish

C. H. French No. 2 Larkin, NW cor. SE sec. 14-19-11. S.D. 225 ft.
Premier Inv. Co. No. 1 McDade, SE SW NE sec. 28-19-11. Drlg. 1,864 ft.
Triangle Drlg. Co. No. 2-C Skannel, sec. 13-17-12. Drlg. sh.&L. 1,794 ft.

Caddo Parish

Ardsell Oil Co. and H. W. Russell No. 2 Muslow, sec. 26-21-16. O.W.W.O.; T.D. 2,246 ft.; set 5 ⅛-in. csg. 2,205 ft.; W. O.S.R.
W. D. Chew No. 4 Spell, SE sec. 29-21-15. S.D. 1,517 ft.; W.O.S.R.
L. T. Davis No. 3 Styles, SE cor. sec. 17-21-16. Set 8-in. csg. 1,015 ft.; comp.; pmp. 25 B.P.D.; T.D. 1,021 ft.
D.O.K. Oil Co. No. 1 Player, SE cor. NW SE sec. 26-21-5. O.W.W.O.; old T.D. 1,600 ft.; set 4½-in. csg. 2,252 ft.; W. O.S.R.; T.D. 2,255 ft.
W. D. Flynn No. 3 Natalie, SW cor. sec. 10-21-16. T.D. 1,029 ft.; W.O.S.R.
W. D. Flynn No. 4 Natalie, SE cor. sec. 10-21-16. R.U.
W. H. Harrison, Jr., No. 3 Crystal Shoreline, SW cor. SW NW sec. 25-21-16. Set 4-in. csg. 2,255 ft.; T.D. 2,264 ft.; W.O.S.R.
Louisiana Oil Prod. Co. No. 14-B Muslow, sec. 4-20-15. S.D. 2,130 ft.; high wtr.
J. F. Mitchell No. 1 Muslow, NE cor. sec. 31-21-15. T.D. 1,600 ft.; comp.; 140 B.P.D.; pmp.
Olson Drlg. Co. No. 1 Sharp, C NW NE sec. 10-18-16. Cg. 5,875 ft.
Petroleum Heat & Power Co. No. 1 Wemple, NW cor. sec. 14-20-15. Set 6-in. csg. 2,185 ft.; T.D. 2,210 ft.
W. G. Ray Drlg. Co. No. 5 Hunter, NE cor. sec. 17-19-14. Set 6⅝-in. csg. 2,428 ft.
S. M. Richardson No. 2 Sentell, sec. 9-19-14. Set 7-in. csg. 2,437 ft.; tstg. 2,471 ft.; W.O.S.R.
A. D. Robinson No. 1 Wilkinson, sec. 22-20-14. T.D. 2,805 ft.; P.B. 2,450 ft.; drld. out to set at 2,500 ft.; tstd. S.W.; D.&A.
J. E. Sedberry No. 1-A Dickinson, sec. 10-19-14. Set 10-in. at 80 ft.; W.O.C.
R. O. Smith No. 1 Lynn, sec. 20-21-14. Cg. 1,510 ft.
Triple M Oil Co. No. 1 Boisseau, sec. 34-21-16. Tstd. S.W. with S.O. 956 ft.; S.D. 984 ft.
Raymond Wright No. 1 Hobbs, NE cor. sec. 29-21-15. Tstd. oil 1,635 ft.; T.A.

Claiborne Parish

Gulf Oil Corp. No. 1 McDonald, NW cor. SE NE sec. 2-20-5. Sat. L. 5,208-13 ft.; set 7-in. csg. 5,198 ft.; T.D. 5,219 ft.
E. O. Heath No. 1-C Patton, sec. 1-20-5. Drlg. sh. 2,755 ft.
Hollifield & McFarland No. 3 Patton Est., SE cor. SE NE sec. 2-20-5. Drlg. L.&sh. 5,097 ft.
J. R. McMurray No. 2 Bean, sec. 32-21-4. Drlg. sh.&anhy. 4,110 ft.
E. T. Oakes et al No. 2 L. Lloyd, SE SE sec. 3-20-5. Drlg. sh.&L. 4,745 ft.
A. O. Olson No. 8-A Patton, sec. 30-21-4. Drlg. anhy.&sh. 3,745 ft.
Scout Oil Corp. No. 2 Bean, NE cor. SW sec. 32-21-4. Set 5½-in. csg. 5,155 ft.; T.D. 5,179 ft.; sat. L. 5,165-74 ft.
Texas Canadian Oil Co. No. 1 Tanner, C N½ SE NE sec. 32-21-4. Set 5½-in. csg. 5,257 ft.; T.D. 5,289 ft.; tstg.
Union Prod. Co. No. 2 Brownfield, sec. 5-19-5. T.D. 9,964 ft.; sh.; recmtd. back to 8,850 ft.; rmg. bridge at 8,475 ft.; drlg. sd.&sh. 8,854 ft.
G. H. Vaughn No. 4 Eppinger, C SW NE sec. 30-21-4. R.U.
G. H. Vaughn No. 3 King, C S½ sec. 30-21-4. Set 5½-in. csg. 5,120 ft.; T.D. 5,133 ft.; comp.; 65 B.P.H.; ½-in. ck.

De Soto Parish

Clear Lake Oil Co. No. 1 J. A. Woolum, NW sec. 29-12-12. W.O.; T.D. 2,690 ft.
Kingston Oil Co. No. 1 Scott, SE cor. NE NE sec. 32-14-13. Comp.; 5 B.P.D.; on pmp.; T.D. 2,777 ft.
Pet. Heat & Power Co. No. 1 DeSoto Corp., SE cor. SW NW sec. 7-11-11. Missed sd.; T.D. sh. 2,868 ft.; prep. B.P.
Pet. Heat & Power Co. No. 1 Matthews, sec. 29-12-11. Drlg. L.&sh. 3,255 ft.
Pet. Heat & Power Co. No. 2 Matthews,

sec. 30-12-11. Set 7-in. csg. 2,505 ft.; T.D. 2,507 ft.

Pet. Heat & Power Co. No. 1 Sample, sec. 29-12-11. Set 10¾-in. csg. 196 ft.; W.O.C.

Pet. Heat & Power Co. No. 1 Taylor, NE cor. NE SE sec. 12-11-12. T.D. 3,695 ft.; P.B. 2,800 ft.; W.O.C.

Pet. Heat & Power Co. No. 2 Taylor, sec. 12-11-12. Drlg. 50 ft.

Pet. Heat & Power No. 1 Williams Est., NE cor. SW SE sec. 12-11-12. Sd. 2,760-87 ft.; tstd. S.W.; will P.B.

Pet. Heat & Power No. 1 Williams W. R., NW NE sec. 13-11-12. S.D. 1,720 ft.

Texas Co. No. 2 White, SW NE sec. 24-12-12. Set 4½-in. csg. 835 ft.; tstd. dry; S.G.; W.O.; T.D. 890 ft.

Yandell Rogers No. 1 Kavanaugh, sec. 18-11-11. Drlg. 25 ft.

Franklin Parish

Southern Star Pet. Co. No. 2 Grayson, NE cor. NE SE sec. 36-12-6e. S.D. 1,754 ft.

La Salle Parish

Pet. Heat & Power Co. No. 1 Gaharan, Lot 7, Blk. 1, Holmes & Adams Addn., sec. 25-10-1e. Set 6-in. csg. 1,530 ft.; T.D. 1,541 ft.; W.O.S.R.

Stovall, Tr., No. 4 Russell, SE SE sec. 25-10-1e. 6-in. csg. at T.D. 1,518 ft.; W.O.S.R.

Lincoln Parish

F. H. Brown No. 2 Patton, C S½ SE SW sec. 6-20-4. R.U.

Compton & Hart No. 1 Patton Est., C N½ NW NE sec. 7-20-4. T.D. 5,307 ft.; rng. csg.

Magnolia Pet. Co. No. 1 Patton Est., NE cor. NW sec. 7-20-4. Set 7-in. csg. 5,379 ft.; T.D. 5,398 ft.; comp.; 170 B.P.D.; ¼-in. ck.

Magnolia Pet. Co. No. 2 Pollock, C S½ NE SE sec. 6-20-4. Drlg. L.&sh. 4,210 ft.

E. T. Oakes & Easton No. 1 Griggs, sec. 36-18-1w. T.D. 6,259 ft.; swbd. dry; W.O.

Morehouse Parish

W. J. Furlong No. 1 Clark, sec. 10-20-7e. Set 9⅝-in. csg. 2,805 ft.; top Big L. 6,207 ft.; hd. gr. cal. strks. L.; ran steel line measurement and Schlumberger; W.O. to attempt deepening further; correct T.D. 6,517 ft.

Natchitoches Parish

Jos. E. Popkins No. 1 Peavy Lbr. Co., NW sec. 36-7n-9w. R.U.; S.D.

Red River Parish

Glassell & Whitehurst No. 1 LeLong, NE NW NE sec. 25-12-11. W.O.; D.S. 1,810 ft.; rmg.

Yandell Rogers No. 5 Gaspair, SE SW sec. 27-13-11. Set 5½-in. csg. 2,453 ft.; T.D. 2,474 ft.; W.O.S.R.

Sabine Parish

Hunter Co. No. 1-B Long Bell Lbr. Co., C SE SW sec. 1-7-13. Tstd. S.G. 2,091 ft.; drlg. 2,095 ft.

Major Oil Co. No. 1 Henry, SE cor. NE SW sec. 12-7-13. Set 7-in. at 2,087 ft.; comp.; 222 B.P.D.; open tbg.; T.D. 2,547 ft.

H. N. Morris No. 1 Irving & Bishop, C NW NW sec. 18-7-12. Set 12-in. at 80 ft.

Pearl Oil Corp. No. 7 Cranford, SW cor. SW SE sec. 20-9-13. Set 6-in. at 1,475 ft.; acdzd.; tstg.; T.D. 1,664 ft.

Plymouth Oil Corp. No. 1 Kezerle, sec. 3-7-13. Set 10-in. csg. 60 ft.

W. L. Posey No. 1 Ramirez, C NW NW sec. 12-7-13. Set 6-in. csg. 2,111 ft.; tstd.; S.O.; fsg. 2,167 ft.

Sutton-Zwolle Oil Co. No. 1 Sabine Lbr. Co., SE cor. NW NE sec. 23-7n-14w. Set 9⅝-in. csg. 2,215 ft.; D.S.T. 3,843-53 ft.; rec. 1,200 ft. P.L.O. 9 min.; W.P. 275 lbs.; T.D. 3,865 ft.; set 7-in. csg. 3,846 ft.

LEGAL

U. S. Department of the Interior, General Land Office, Washington, D. C. Notice is hereby given that the following lands are offered to the responsible qualified bidder of the highest bonus per acre, for leasing pursuant to section 17 of the act of February 25, 1920 (41 Stat 437), as amended by the act of August 21, 1935 (49 Stat. 674), at the royalty rate scale in the lease form shown in Circular 1386: Carterville-Sarepta Oil and Gas Field, lot 2 Sec. 2, lot 4 Sec. 4, lots 3 and 4 Sec. 5, T. 22 N., R. 11 W., SE¼ NW¼ Sec. 31, T. 23 N., R. 11 W., La. M., 99.77 acres; Rodessa Oil and Gas Field, Unit No. 3, NW¼ SE¼ Sec. 5, T. 23 N., R. 15 W., 28.93 acres; Unit No. 4, SW¼ NE¼ Sec. 2, T. 23 N., R. 16 W., 27.96 acres. The sale will be held in the Federal Court Room, Post Office Building, Shreveport, Louisiana, at 12:00 noon on April 11, 1938. The successful bidder must deposit on the day of the sale a certified check on a solvent bank, or cash, for 1/5 of the amount of each bid, and file the showing of qualifications to receive a lease required by section 7 of General Land Office Circular No. 1386. The remaining 4/5, together with the annual rental in advance, at the rate of $1 per acre, must be paid prior to the issuance of the lease. The bidders are warned against violations of the provisions of section 59 of the U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Fred W. Johnson, Commissioner.

Tensas Parish

H. V. Schumacker No. 4 Mount Plantation, sec. 39-11-12e. R.U.

Union Parish

Standard Oil Co. of La. No. 1 Frost Lbr., sec. 14-21-1e. Cg. sh.&strks. L. 7,647 ft.

Webster Parish

S. W. L. Backus No. 4 Pardee Co., NE sec. 3-22-11. Set 10-in. csg. 156 ft.

Hunt Oil Co. No. 6 Babb, C NE SW sec. 14-21-10. Drlg. L.&sh. 3,585 ft.

Hunt Oil Co. No. 8 Davis, C NW NE sec. 23-21-10. Drlg. L.&sh. 3,246 ft.

Hunt Oil Co. No. 19 Hope, NW cor. sec. 24-21-10. Drlg. L.&sh. 5,485 ft.

C. E. Lunsford No. 1 Turner, SW cor. SE sec. 20-20-8. T.D. 2,309 ft.; D.&A.

Magnolia Pet. Co. No. 1 Coyle-Tiner, C sec. 21-21-10. Drlg. 5,885 ft.

Magnolia Pet. Co. No. 2 Crichton, SE cor. NE NW sec. 33-21-10. Drlg. sdy. sh. 4,850 ft.

Ohio Oil Co. No. 5 Holloway, NE cor. SE NE sec. 23-21-10. O.W.W.O.; R.U. to deepen.

Magnolia Pet. Co. No. 1 Sexton Unit, NW SE sec. 32-23-9. Cg. sdy. sh. 8,003 ft.

Midstates Oil Corp. No. 1 Weiori Lbr. Co., C NW NW sec. 3-20-10. R.U.

Morgan et al No. 1-A Hope, C NW NW sec. 25-21-10. Drlg. sh.&anhy. 4,010 ft.

North American Oil Consol. Co. No. 1 Stewart, C SE NE sec. 32-27-10. Set 9⅝-in. csg. 5,866 ft.; drlg. sdy. sh. 7,390 ft.

Ohio Oil Co. No. 3 Bodcaw, Acct. 4, sec. 28-21-10. Rng. csg. 831 ft.

Ohio Oil Co. No. 48 Bodcaw Acct. 2, sec. 15-21-10. Set 7-in. csg. 8,360 ft.; T.D. 8,410 ft.; tstg.

Ohio Oil Co. No. 49 Bodcaw (Acct. 3), C NW NW sec. 34-21-10. Set 13⅜-in. csg. 808 ft.; T.D. 5,771 ft.; set csg. 5,615 ft.

Ohio Oil Co. No. 1 Crutsinger, NE cor. sec. 35-21-10. T.D. 5,860 ft.; set csg. 5,628 ft.

Ohio Oil Co. No. 1 Gray, NW cor. SE NW sec. 28-21-10. R.U.

Ohio Oil Co. No. 24 Gray, NE cor. sec. 35-21-10. Drlg. 2,542 ft.

Ohio Oil Co. No. 5 Holloway, NE cor. SE NE sec. 23-21-10. Pig. lnr. to deepen, 4,712 ft.

Oliphant No. 3 Banks, sec. 34-21-10. Drlg. sh. 2,405 ft.

A. G. Oliphant No. 1 Central Inv. Co., C NW SE sec. 33-21-10. Holloway sd. 5,862-91 ft.; T.D. 5,905 ft.

A. G. Oliphant No. 1 Stewart, sec. 33-21-10. Drlg. L.&sh. 5,643 ft.

Stanolind O. & G. Co. No. 1 Pardee Co SW NE sec. 36-21-10. T.D. 6,003 ft.; set 9⅝-in. csg. 5,992 ft.; sqzd. csg. leak; W.O.C.

Union Prod. Co. No. 1 Stewart, SE cor. SE sec. 28-21-10. Drlg. sdy. sh. 7,254 ft.

Winn Parish

G. W. Ziegen No. 13 La. Cen. Lbr. Co., sec. 4-13-1e. 12-in. at 62 ft.; W.O.C.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co. No. 1 Faulk, sec. 66-12s-3e. 10¾-in. csg. 1,585 ft.; T.D. 7,600 ft.

Continental Oil Co. No. 1 Hebert, sec. 67-12s-3e. 10¾-in. csg. 1,510 ft.

Anse La Butte—St. Martin Parish

Crusader Oil Co. No. 2 Central Oil Co., sec. 86-9s-5e. T.D. 2,015 ft.; 7-in. csg. 1,993 ft.; perf. csg. 1,960-66 ft.; tstd. S.W.; abd.

Austin B. Taylor No. 5 Begnaud, sec. 117-9s-5e. 7-in. csg. 826 ft.; T.D. 1,689 ft.; P.B. 840 ft.; abd.

Bay St. Elaine—Terrebonne Parish

F. J. LeBlanc No. 2 Wurzlow, sec. 17-22s-18e. S.D. 816 ft.

Bayou Blue—Iberville Parish

Humble O. & R. Co. No. 6 Wilbert Sons Lbr. Co., sec. 66-9s-11e. Drlg. sdy. sh. 2,900 ft.

Bayou Cocotris—Terrebonne Parish

Shell Pet. Corp. No. 5 Pelican. 10¾-in. csg. 2,480 ft.

Shell Pet. Corp. No. 4-B Realty Operators, sec. 17-17s-15e. 10¾-in. csg. 2,456 ft.; T.D. 9,042 ft.; oil sd.; 7-in. csg. 9,485 ft.

Bayou De Allemands—St. Charles Parish

Amerada Pet. Corp. No. 1 St. Charles Ld. Co., sec. 38-15s-20e. 10¾-in. csg. 2,698 ft.; top salt 9,255 ft.; T.D. 9,263 ft.; 7-in. csg. 7,200 ft.; Schlumberger shwd. 7¾ ohms, 130 millivolts; P.B. 6,940 ft.; perf. csg. 5,412-17 ft.; tstd. S.W.; P.B. 5,525 ft.; abd.

Amerada Pet. Corp. No. 1 Gheens Realty Co., sec. 56-15s-20e. T.D. 2,695 ft.; run surf. csg.

Big Lake—Cameron Parish

Union Sulphur Co. No. 2 Miami Corp., sec. 19-12s-8w. T.D. 7,924 ft.; P.B. 7,650 ft.; to sdtrk.; drlg. sd. rk. 8,194 ft.

Black Bayou—Calcasieu Parish

Shell Pet. Corp. No. 40 Watkins. T.D. 6,168 ft.; fsg.

Edgerly—Calcasieu Parish

La. Crusader Oil Co. No. 1 La. Prairie, sec. 21-9s-11w. T.D. 5,108 ft.; P.B. and sdtrk.; T.D. 3,082 ft.; P.B. and S.T. 2,350 ft.; T.D. 2,891 ft.; P.B. and sdtrkd.; drlg. L. rk. 4,229 ft.

Caillou Island—Terrebonne Parish

Texas Co. No. 1 L.L.&E., sec. 18-23s-20e. Drlg. sh. 4,692 ft.

Cameron Meadows—Cameron

Burton-Sutton Oil Co. No. 23 School Ld., sec. 16-14s-13w. R.U.

Burton-Sutton Oil Co. No. 22 Sch. Ld., sec. 16-14s-13w. T.D. 4,014 ft.; 7-in. csg. 3,992 ft.; I.P. 390 B.P.D.; ¼-in. ck.

Magnolia Pet. Co. No. 22 Cameron Meadows, sec. 21-14s-13w. Drk.

Cheneyville—Rapides Parish

Amerada Pet. Corp. No. 4 Weil, sec. 53-1s-2e. 9⅝-in. csg. 6,471 ft.; drlg. anhy.

Charenton—St. Mary Parish

Pan American Prod. Co. No. 5 Law Realty Co., sec. 25-13s-9e. R.U.

Pan American Prod. Co. No. 3 Robichaux, sec. 11-13-9e. R.U.

Pan American Prod. Co. No. 3 South Coast Corp., sec. 30-18s-10e. T.D. 7,833 ft.; fsg.

Pan American Prod. Co. No. 3 Veeder, sec. 11-13s-9e. Drlg. sdy. sh. 1,860 ft.

Choctaw—Iberville Parish

Louisiana Crusader Oil Co. No. 1 E. B. Schwing, sec. 29-8s-11e. T.D. 8,969 ft.; well tried to blow out; stk. D.S.; fsg.

Standard Oil Co. No. 8 Gay, sec. 52-9s-11e. T.D. 6,125 ft.; prep. to resume drlg.

Darrow—Ascension Parish

Darrow Oil Co. No. 1 Dennis, sec. 68-10s-2e. Drlg. sh. 2,000 ft.

Humble O. & R. Co. No. 13 Gumbel, sec. 33-10s-2e. Drlg. sh.&L. 6,708 ft.

Kiva Oil Co. No. 1 Duplessis, sec. 69-10s-2w. T.D. 60 ft.; S.D.

Dog Lake—Terrebonne Parish

Texas Co. No. 21 State, sec. 5-22s-18e. T.D. 7,174 ft.; P.B. 5,500 ft.; sdtrkd.; T.D. 5,761 ft.; P.B. 5,631 ft.; W.O.C.

Fausse Point—Iberia Parish

Texas Co. No. 4 State, sec. 35-11s-8e. 18⅝-in. csg. 90 ft.; top sd. 7,912 ft.; top salt 6,595 ft.; drlg. sh. 8,244 ft.

Four Isle—Terrebonne Parish

Texas Co. No. 9 L.L.&E., sec. 24-21s-16e. T.D. 8,553 ft.; P.B. 3,881 ft.; sdtrk.; T.D. 6,943 ft.; 9⅝-in. csg. 6,870 ft.; drlg. sd. 9,994 ft.

Garden Island—Plaquemines Parish

Texas Co. No. 18 State, sec. 37-23s-33e. T.D. 5,064 ft.; P.B. and sdtrkd.; drlg. sh. 4,520 ft.

Texas Co. No. 26 state, sec. 37-23s-33e. Cg. salt 6,416 ft.

Hackberry—Cameron Parish

W. T. Burton No. 3 Lewis, sec. 22-12s-10w. R.U.

W. T. Burton No. 5 Vincent, sec. 22-12s-10w. Drlg. sh.&L. 3,410 ft.

F. J. LeBlanc No. 1 Doiron, sec. 36-12s-10w. T.D. 3,780 ft.; 5-in. csg. 3,758 ft. swbg. wsh. wtr.

Stanolind O. & G. Co. No. 8 Carter & Sweeney, sec. 22-12s-10w. R.U.

Stanolind O. & G. Co. No. 10 Carter & Sweeney, sec. 22-12s-10w. R.U.; (cor.).

Stanolind O. & G. Co. No. 8 Duhon, sec. 22-12s-10w. T.D. 3,300 ft.; perf. csg. 3,230-44 ft.; tstg.

Stanolind O. & G. Co. No. 54 State-Kelso, sec. 16-12s-10w. Drlg. sh.&L. 5,213 ft.

Superior Oil Co. No. 1 Benson-Vincent, sec. 30-12s-10w. Drlg. sdy. sh. 5,694 ft.

Texas Co. No. 24-B State, sec. 12s-9w. Drlg. L. 5,532 ft.

Union Sulphur Co. No. 1 Doiron, sec. 37-12s-10w. T.D. 4,888 ft.; 7-in. csg. 4,876 ft.; heaving sh. 5,940 ft.; P.B. 3,572 ft.; sdtrkg. at 3,531 ft.

York Oil Field Supply No. 3 Vincent, sec. 28-12s-10w. T.D. 2,947 ft.; P.B. 2,895 ft.; P.B. 2,848 ft.; to sdtrk.; T.D. 3,285 ft.; P.B. to 2,800 ft.; W.O.C.

Horseshoe Bayou—St. Mary Parish

Texas Co. No. 1 St. Mary Parish Ld. Co., sec. 37-17s-9e. 13⅜-in. csg. 1,837 ft.; drlg. sh.&sd. 10,492 ft.

Jeanerette—St. Mary Parish

Herton Oil Co. No. 2 Carter, sec. 38-13s-9e. T.D. 9,939 ft.; 7-in. csg. 9,937 ft.; T.D. 10,390 ft.; S.D.

Jennings—Acadia Parish

Fred I. Getty No. 1 Jennings fee, sec. 46-9s-2w. T.D. 1,871 ft.; 6⅝-in. csg. 1,591 ft.; T.D. 2,057 ft.; stuck screen. P.B. and sdtrkd.; T.D. 2,062 ft.; I.P. 100 bbls. oil and 75 bbls. S.W. per day.

Gulf Ref. Co. No. 39 Arnaudit, sec. 47-9s-2w. T.D. 4,840 ft.; P.B. 2,585 ft.; T.D. 4,586 ft.; 9⅝-in. csg. 4,578 ft.; drlg. sd. 5,459 ft.

Jolly Pet. Co. No. 2 McFarlain, sec. 41-9s-2w. T.D. 4,235 ft.; sh.&L.

Ladak Oil Co. No. 4 Clement, sec. 46-9s-2w. T.D. 1,852 ft., sd.; 6⅝-in. csg. 1,650 ft.; I.P. 100 bbls. oil, 20 bbls. S. W. per day; pmpg.

Pet. Heat & Power Co. No. 1 Iowa-Jennings, sec. 45-9s-2w. R.U.R.

Stanolind O. & G. Co. No. 19 Houssiere-Latrelle, sec. 47-9s-2w. T.D. 6,448 ft.; P.B. 6,135 ft. to strtn. hole; T.D. 6,979 ft.; P.B. 6,700 ft.; cg. sd. S.O. 7,200 ft.

Superior Oil Co. No. 1 Julis Clement, sec. 46-9s-2w. T.D. 7,324 ft.; D.S. stuck; P. B. to sdtrk.; oil sd. 7,028-88 ft.; T.D. 6,972 ft.; 7-in. csg. 6,950 ft.; I.P. 431 B.P.D.; 14/64-in. ck.

Superior Oil Co. No. 2 Julis Clement, sec. 46-9s-2w. R.U.

Superior Oil Co. No. 6 Jennings-Heywood, sec. 41-9s-2w. T.D. 6,056 ft.; fsg. P.B. and sdtrkd.; drlg. sd.&sh. 4,133 ft.

Superior Oil Co. No. 9 Leckelt, sec. 42-9s-2w. T.D. 7,480 ft.; P.B. 5,302 ft.; T.D. 7,062 ft.; P.B. 5,120 ft.; to sdtrk.

Superior Oil Co. No. 10 Leckelt, sec. 43-9s-2w. R.U.

Superior Oil Co. No. 11 Leckelt, sec. 42-9s-2w. Drlg. sh. 5,757 ft.

Superior Oil Co. No. 12 Leckelt, sec. 42-9s-2w. Drlg. sh. 1,385 ft.

Superior Oil Co. No. 13 Leckelt, sec. 42-9s-2w. R.U.

Victor Weisse No. 1 Clement, sec. 46-9s-2w. Top salt 3,819 ft.; S.D. 3,938 ft. D.S. stk.; T.D. 3,139 ft.; fsg.

Lafitte—Jefferson Parish

Texas Co. No. 2 Marrero Ld. & Inv. Co., sec. 21-17s-24e. T.D. 10,187 ft.; run 7⅝-in. csg.

Texas Co. No. 3 Marrero Ld. Co., sec. 29-17s-24e. R.U.

Texas Co. No. 9 Rigolet-Cooperation Fur Co., sec. 29-17s-24e. Drlg. sdy. sh. 6,319 ft.

Lake Hermitage—Plaquemines Parish

Gulf Ref. Co. No. 7 Lafourche, sec. 12-18s-25e. 7-in. csg. 8,074 ft.; T.D. 9,786 ft.; sdtrkd. hole; T.D. 9,770 ft.; P.B. 9,090 ft.; perf. csg. 8,720-40 ft.; making D.S.T.; I.P. 5 bbls. dist. per day through ⅛-in. ck.; T.P. 1,040 lbs.

Lake Long—Lafourche Parish

Fohs Oil Co. No. 4 State, sec. 64-17s-19e. 10¾-in. csg. 2,707 ft.

Lake Pelto—Terrebonne Parish

Texas Co. No. 19 State-Lake, sec. 17-23s-18e. Drlg. sh. 4,546 ft.

Leesville—Lafourche Parish

Texas Co. No. 68 L.L.&E., sec. 27-21s-22e. Drlg. sh. 2,058 ft.

Lirette—Terrebonne Parish

Humble O. & R. Co. No. 1 Wurzlow, sec. 29-19s-19e. Drlg. sh. 1,180 ft.

Union Prod. Co. No. 1 Fundenburk, Unit 1, sec. 50-19s-19e. Drlg. sh.&sd. 2,047 ft.

New Iberia—Iberia Parish

Wm. Helis No. 5 Bolivar, sec. 56-12s-7e. T.D. 4,337 ft.; salt; P.B. and sdtrkd.; drlg. sdy. sh.&L. 3,610 ft.

Wm. Helis No. 4 Schwing, sec. 56-12s-7e. Drlg. sh. 3,120 ft.

Texas Co. No. 10-B Hanzen, sec. 54-12s-7e. T.D. 4,925 ft.; salt; P.B. and sidetracked; cg. sd. 5,210 ft.

North Crowley—Acadia Parish

Humble O. & R. Co. No. 2 Federal Ld. Bk., sec. 34-8s-1e. T.D. 7,925 ft.; tstd. S.W.; perf. csg. 7,747-51 ft.; I.P. 32 B. P.H.; ¼-in. ck.

Humble O. & R. Co. No. 2 Habetz, sec. 45-8s-1e. Drk.

Humble O. & R. Co. No. 1 Smith, sec. 44-8s-1e. Drlg. sh.&L. 5,319 ft.

Humble O. & R. Co. No. 1 Traham, sec. 3-9s-1e. Drlg. L. 8,314 ft.

Port Barre—St. Landry Parish

Pan American Prod. Co. No. 4 Cormier, sec. 4-6s-5e. Drlg. sd.&sh. 2,780 ft.

Texas Co. No. 22 Botney Bay Lbr. Co., sec. 4-6s-5e. T.D. 3,569 ft.

Quarantine Bay—Plaquemines Parish

Gulf Ref. Co. No. 4 State, sec 17-17e. T.D. 5,700 ft.; 9⅝-in. csg. 5,560 ft.

Roanoke—Jeff Davis Parish

Humble O. & R. Co. No. 11-B Devilbiss, sec. 11-9s-4w. Drlg. sh.&L. 8,230 ft.

Sorrento—Ascension Parish

Sorrento Oil Co. No. 1 L. L. Barnard et al, sec. 16-10s-4e. 10¾-in. csg. 1,070 ft top salt 4,102 ft.; S.D. 4,166 ft.; salt.

South Elton—Jeff Davis Parish

Stanolind O. & G. Co.-Amerada Pet. Corp. No. 3-B Calcasieu Natl. Bank, sec. 27-7s-3w. T.D. 9,154 ft.; conditioning hole; 9⅝-in. csg. 8,647 ft.; drlg. sh. 11,177 ft.

Starks—Calcasieu Parish

Capital Oil Co. No. 1 Lutcher-Moore, sec. 24-9s-13w. R.U.

Sulphur—Calcasieu Parish

Union Sulphur Co. No. 852 fee, sec. 29-9s-10w. T.D. 5,068 ft.; P.B. and sdtrkd.; T.D. 5,193 ft.; salt; P.B. 1,703 ft.; drlg. sdy. sh. 3,163 ft.

Union Sulphur Co. No. 858 fee, sec. 29-9s-10w. T.D. 5,027 ft.; P.B.; sdtrkd.; drlg. sdy. sh. 4,163 ft.

Valentine—Lafourche Parish

Wm. Helis No. 1 Valentine-Sugars, Inc., sec. 2-17s-20e. Drlg. sh. 6,900 ft.

Pan American Prod. Co. No. 1-B Community, sec. 58-17s-20e. S.D. 8,152 ft.

Pan American Prod. Co. No. 16 Harang, sec. 7-17s-20e. T.D. 7,236 ft.; P.B. and sdtrkd.; drlg. sh.&sd. 5,413 ft.

Pan American Prod. Co. No. 17 Harang, sec. 9-17s-20e. Drlg. sdy. sh. 6,945 ft.

Venice—Plaquemines Parish

Tide Water Oil Co. No. 5 Manhattan Fruit Co., sec. 26-26s-30e. Top oil sd. 7,250 ft.; T.D. 7,300 ft.; P.B. 4,800 ft.; sdtrkd. at 4,813 ft.; T.D. 6,950 ft.

Tide Water Asso. Oil Co. No. 6 Manhattan Ld. & Fruit Co., sec. 26-21s-30e. Cd. sd. S.O. 5,950-65 ft.; drlg. hd. sd. 6,830 ft.

Vinton—Calcasieu Parish

M. McLean No. 17 Gray, sec. 35-10s-12w. R.U.

Sutton-Burton No. 1 Calcasieu Natl. Bk., sec. 3-11s-12w. T.D. 4,500 ft.; S.D.

Villa Platte—Evangeline Parish

Continental Oil Co. No. 1 N. H. Hirsch, sec. 44-3s-2e. Drlg. sh.&L. 8,341 ft.

Continental Oil Co. No. 1 McDaniels, sec. 44-3s-2e. Drlg. sh.&L. 7,761 ft.

Continental Oil Co. No. 1 Tate, sec. 44-3s-2e. Drlg. sh.&L. 7,769 ft.

Welsh—Jeff Davis Parish

Howard Clayton No. 1 Walshe, sec. 21-9s-5w. Oil show 1,030-31 ft.; T.D. 1,215 ft.; I.P. 2 B.P.D.; pmpg.
J. Massart No. 1 L. T. Mathews, sec. 27-9s-5w. Drlg. gravel 210 ft.
Stanolind O. & G. Co. No. 1 W. B. Conover, sec. 20-9s-5w. 13⅜-in. csg. 2,017 ft.; drlg. sh.&L. 6,668 ft.

White Castle—Iberville Parish

Shell Pet. Corp. No. 6 Shingle. T.D. 6,449 ft.; sd. S.O.

Woodlawn—Jeff Davis County

Union Sulphur Co. No. 2 Calcasieu Natl. Bk., sec. 12-9s-6w. Drlg. sh. 7,657 ft.

S. LOUISIANA WILDCATS

Acadia Parish

H. E. Dalton No. 1 Setting, sec. 17-7s-1w. T.D. 5,106 ft.; P.B. to approx. 500 ft. T.D. 3,925 ft.; D.S. stuck.
Humble O. & R. Co. No. 1 Finch, sec. 22-10s-1e. 9⅝-in. csg. 7,474 ft.; drlg. sh. 8,818 ft.

Avoyelles Parish

G. C. Koch et al No. 1 Kelone, sec. 21-2n-3e. 10¾-in. csg. 987 ft.

Beauregard Parish

Republic Prod. Co. No. 1 Lutcher-Moore Lbr. Co., sec. 10-13w-6s. 10¾-in. csg. 1,015 ft.

Calcasieu Parish

Republic Prod. Co. No. 1 Sabine Tram. Co. sec. 25-18s-14w. 10¾-in. csg. 1,981 ft. T.D. 9,620 ft.; hole clean; S.D.; abd.
Shell Pet. Corp. No. 1 Calcasieu Natl. B. sec. 18-11s-10w. T.D. 9,043 ft.; sd.; odor of gas.
Sun Oil Co. No. 1 Lutcher-Moore Lbr. Co., sec. 1-8s-13w. R.U.
Wheeler Oil Corp. No. 2 Sch. Ld., sec. 1, 9s-7w. 15½-in. csg. 46 ft.; S.D. 641 ft.

Cameron Parish

Humble O. & R. Co. No. 1-B Miami Corp., sec. 7-14s-6w. 13⅜-in. csg. 2,150 ft.; drlg. sdy. sh. 7,786 ft.

Cameron Parish—Gulf of Mexico

Superior Oil Prod. Co. et al No. 1 State Gulf of Mexico, 3,800 ft. W, 6,200 ft. S of SE cor. of irregular sec. 4-15s-8w. 10¾-in. csg. 1,157 ft.; 7⅝-in. csg. 7,166 ft.; T.D. 9,394 ft., sd.; well attempted to blow out; killed; D.S. stk. 8,800 ft.; P.B. 5,500 ft.; to test.
Superior Oil Co. No. 1 John Sells, sec. 5-15s-8w. Loc.

East Baton Rouge Parish

Austin B. Taylor No. 1 Duplantier, sec. 65-7s-1w. Drlg. sdy. sh. 5,770 ft.

Iberia Parish

Texas Co. No. 1 Bayless-Jones, sec. 58-12s-5e. Drlg. sdy. sh. 3,689 ft.
Texas Co. No. 2-B Vermilion Bay, sec. 20-16s-5e. T.D. 9,101 ft.; P.B. and sdtrkd at 5,788 ft.; T.D. 7,020 ft.; P.B. 6,385 ft.; to sdtrk.; T.D. 7,623 ft.; P.B. 7,176 ft.; to sdtrk.

Lafayette Parish

Continental Oil Co. No. 1 Foreman, sec 36-9s-3e. Drlg. sd. 8,350 ft.

Pointe Coupe Parish

Batchelor Oil Co. No. 1 Hackney, sec 28-3s-8e. 20-in. csg. 117 ft.; 13⅜-in. csg. 2,170 ft.; drlg. sh. 5,087 ft.

St. Bernard Parish

Gulf Ref. Co. No. 3 State Lake, Twp. 12s-15e. R.U.

St. James Parish

Continental Oil Co. No. 1 Realty Operators, sec. 17-12s-17e. R.U.

St. Landry Parish

Nixon & Toombs No. 1 Boagni, sec. 41-6s-4e. R.U.

St. Martin Parish

Carter & Stewart No. 2 Martin, sec. 32 9s-7e. Top salt 4,477 ft.; T.D. salt 4,485 ft.
Shell Pet. Corp. No. 1 Unit, sec. 11-14s 12e. Cg. sd. 9,130 ft.
Texas Co. No. 4 State Lake Mongoulois, sec. 14-10s-9e. Top salt 7,970 ft.; T.D. 7,988 ft.; abd.

St. Mary Parish

Pet. Heat & Power Co. No. 9, sec. 9-13s-9e. S.D. 3,009 ft.

Terrebonne Parish

Fohs Oil Co. No. 1 Buckley & Bourg, sec. 77-19s-17e. Drlg. sh. 8,497 ft.
Fohs Oil Co. No. 1 State, sec. 41-19s-19e. 18⅝-in. csg. 246 ft.; cd. sd. S.G. 6,894-6,915 ft.; drlg. sh. 8,000 ft.

TEXAS

Week Ending March 12

GULF COAST FIELDS

Lockridge—Brazoria County

Gulf Oil Corp. No. 5 Carrie Baker, J. W. Hall Sur. No. 11. Drk.
Gulf Oil Corp. No. 6-A Wilkes and Smith, J. W. Hall Sur. No. 11. Drlg. sdy. sh. 1,686 ft.

Hastings Field—Brazoria County

Humble O. & R. Co. No. 1 R. D. Haden, R. Hoppel Sur. Drlg. sh. 5,187 ft.
Humble O. & R. Co. No. 9 W. G. McDeed, H.T.&B. Sur. No. 27. Drlg. sh. 1,536 ft.
Navarro Oil Co.-Humble O. & R. Co. No. 3-A W. F. Beers, Perry and Austin Sur. Drlg. 2,100 ft.
Stanolind O & G. Co. No. 10 F. N. Brown, H.T.&B. Sur. No. 29. Drlg. 1,310 ft.
Stanolind O. & G. Co. No. 20 Drake, H. T.&B. Sur. No. 36. R.U.
Stanolind O. & G. Co. No. 15-A H. H. Ford, A.C.H.&B. Sur. R.U.
Stanolind O. & G. Co. No. 8 Guido, H.T. &B. Sur. No. 36. Drk.
Stanolind O. & G. Co. No. 6 Matsushita, H. Stevens Sur. Drlg. sh. 2,630 ft.
Stanolind O. & G. Co. No. 1 R. J. Schmidt, H. Stevens Sur. R.U.
Stanolind O. & G. Co. No. 2 Velma Stockwell, H. Stevens Sur. Drlg. sh. 5,316 ft.

Old Ocean—Brazoria County

Harrison & Abercrombie No. 5 Bernard, C. Breen Sur. 9⅝-in. csg. 7,000 ft.; cg. sd.&sh. 9,786 ft.
Harrison & Abercrombie No. 1 Osberne, C. Breen Sur. Cd. sdy. sh. 9,596 ft.
Harrison & Abercrombie Oil Co. No. 1 Troyer and West Texas Abst. Co., C. Breen Sur. Drlg. sh. 9,173 ft.

West Columbia—Brazoria County

Adrian Moore No. 2 Gulf fee, George Tennille Sur. Drlg. sh. 3,410 ft.
Frost and Dunnan No. 1 E. S. Parker, Geo. Tennille Sur. Bldg. drk.
Mike Hogg No. 1 Varner, M. Varner Sur. Drlg. sh. 1,175 ft., (no report).
Sterling O. & R. Co. No. 1 Munson, G. Tennille Sur. Drlg. sh. 2,865 ft.
Texas Co. No. 20-A Abrams, George Tennille Sur. Drlg. sh.&L. 3,356 ft.
Texas Co. No. 2 Goldman, G. Tennille Sur. Drlg. sdy. sh. 4,426 ft.
Texas Co. No. 7 J. G. Phillips, George Tennille Sur. Drlg. sh.&L. 2,376 ft.
Texas Co. No. 4 T. L. Smith, Geo. Tennille Sur. Drlg. sh.&sd. 5,213 ft.
Wallace Oil Co. and others No. 1 Hargrove, G. Tennille Sur. Drlg. sh. 3,510 ft.

Calhoun—Heyser—Victoria County

Blanco Oil Co.-Buchannan No. 8 C. S. Dunwoody, 7-in. csg. 5,499 ft.; no report.
Blanco Oil Co. et al No. 9-C Dunwoody, A. Sisneros Sur. R.U.
George Echols No. 5 O. M. Lander, J. E. Galban Sur. Drlg. sh. 3,430 ft.
Gulf Oil Corp. No. 2 R. R. Bonner, J. E. Galban Sur. Drlg. sh. 5,610 ft.
Gulf Oil Corp. No. 3-B T. P. Traylor, J. E. Galban Sur. T.D. 6,069 ft.; perf. csg. to test; comp.; no ga.
Gulf Oil Corp. No. 4-B C. P. Traylor, J. Galban Sur. Drk.
Magnolia Pet. Co. No. 6 O. M. Lander, J. E. Galban Sur. T.D. 6,032 ft.; no report.
Sinclair Prairie Oil Co. No. 12 W. H. Bennett, A. Sisneros Sur. R.U.
Sun Oil Co. No. 7 W. N. Coffey, G. E. Galban Sur. 7-in. csg. 5,745 ft.; T.D. 5,750 ft.; tstg.

Cedar Point Field—Chambers County

Humble O. & R. Co. No. 1 State, sec. 95. Drive piling.
Standard Oil Co. of Texas and Salt Dome Oil Co. No. 2 State, sec. 119. Driving piling.

Seabreeze—Chambers County

Sun Oil Co. No. 1 R. J. Barrow, A. Yarbo Sur. R.U.
Sun Oil Co. No. 1 Seabreeze Ld. Co., H.T.&B. Sur. 102. 10¾-in. csg. 1,948 ft. T.D. 8,889 ft.; 7-in. csg. 8,865 ft.; tstd. S.W.
Sun Oil Co. No. 1 J. T. White, sec. 118, H.T.&B. Sur. T.D. 8,485 ft.; oil sd.; rng. csg.

Silsbee—Hardin County

Humble O. & R. Co. No. 1 B. L. Kirkendall, NE offset to No. 1 Howell. Loc.
Republic Prod. Co.-Houston Oil Co. No. 28 Brooks, G. W. Banks Sur. 10¾-in. csg. 1,553 ft.; drlg. sh. 6,820 ft.

Clinton—Harris County

Stanolind O. & G. Co. No. 1 Nora Barraco, Reels & Troubough Sur. 9⅝-in. csg. 2,509 ft.; T.D. 3,826 ft.; 5⅜-in. csg. 3,806 ft.; tstg.

Eureka—Harris County

Jack Frazier No. 1 Bollmer & Neimann, J. Reinerman Sur. 10¾-in. csg. 2,540 ft.; drlg. sh. 6,067 ft.

Fairbanks—Harris County

Amerada-Stanolind O. & G. Co. No. 1 E. M. White, Geo. Ayers Sur. Drlg. sh. 4,465 ft.
E. L. Smith and H. B. Ownby Drlg. Co. T.D. 6,846 ft.; perf. csg. 6,831-44 ft. and 6,847-52 ft.; tstg.
H. E. Williams No. 1 A. Vega, G. Williams Sur. 10¾-in. csg. 850 ft.; T.D. 6,836 ft.; run csg.

Friendswood—Harris County

Humble O. & R. Co. No. 1 H. Goodwin, W. K. Smith Sur. Drlg. sh. 5,940 ft.
Humble O. & R. Co. No. 4 E. A. Grey, Perry and Austin Sur. R.U.
Humble O. & R. Co. No. 5 E. A. Grey, Perry and Austin Sur. Drk.
Humble O. & R. Co. No. 6 E. A. Gray, Perry & Austin Sur. Drlg. sh. 1,236 ft.
Humble O. & R. Co. No. 1 J. L. Jones, Perry & Austin Sur. Drk.
Humble O. & R. Co. No. 1 J. H. Merry, Perry & Austin Sur. T.D. 6,042 ft.; run csg.
Humble O. & R. Co. No. 1 W. H. Moore, W. D. C. Hall Sur. Drlg. sh. 4,972 ft.
Humble O. & R. Co. No. 1 E. E. Watson. Drk.
Humble O. & R. Co. No. 1 B. A. Whitcomb, T. Choate Sur. T.D. 6,049 ft.; run csg.

Hitchcock—Galveston County

N. W. Hunter No. 2 M. Stewart, J. Spillman Sur. T.D. 5,250 ft.; P.B. 1,500 ft.; T.D. 5,320 ft.; abd.
Red Bank Oil Co. No. 1 Stewart Title-Guaranty Co., Lot 6, Blk. S, J. D. Moore Sur. Drlg. sh. 4,586 ft.

LaBelle—Jefferson County

Sun Oil Co. No. 3 Broussard-Hebert, B. Blackman Sur. Drlg. sh.&L. 7,172 ft.

North Cheek—Jefferson County

Magnolia Pet. Co. No. 3-A Phelan, S. Stevers Sur. Drlg. sh. 8,988 ft.

Hardin—Liberty County

Ark. Fuel Oil Co. No. 1 W. J. Green, A. B. Hardin Sur. T.D. 7,615 ft.; run csg.
Atlantic Ref. Co. No. 2 W. McMurtry, H. B. Johnson Sur. Spd.
Jack Frazier No. 1 Buffam-Benning, J. Robeson Sur. 10¾-in. csg. 1,258 ft.; T.D. 7,475 ft.; tstg.
Fohs Oil Co. No. 1 Johnson, H. B. Johnson Sur. R.U.
Gulf Oil Corp. No. 1 J. C. Barfield, H. B. Johnson Sur. T.D. 7,624 ft.; W.O.C.
Gulf Oil Corp. No. 1 M. F. Tullos, H. B. Johnston Sur. Drlg. sh. 5,169 ft.
Halliburton Oil Prod. Co. No. 1 Hanchey, H. B. Johnson Sur. T.D. 7,622 ft.; run csg.
Humble O. & R. Co. No. 1 W. McMurtry, H. B. Johnson Sur. T.D. 7,569 ft.; tstg.
Humble O. & R. Co. No. 1 Partlow, H. B. Johnson Sur. Loc.
Sun Oil Co. No. 1 A. A. Hisey, H. B. Johnston Sur. Drlg. sh. 7,438 ft.
L. W. Wickes No. 2 Tullos, H. B. Johnston Sur. T.D. 7,602 ft.; W.O.C.

Bay City—Matagorda County

Hamman Expln. Co. No. 2 Crooke, E. Hall Sur. Top sd. 9,660 ft.; no report.
Hamman Expln. Co. No. 2 G. M. Sloan, J. T. Belknap Sur. Drk.
Pan American Prod. Co. No. 1 Richers I.&G.N. Sur. X-3. Cg. sdy. sh. 9,660 ft.
Smith & McDannald No. 2 Gaines, E. Hall Sur. T.D. 8,165 ft.; 7-in. csg. 8,074 ft.

Buckeye—Matagorda County

United North & South Development Co. No. 1 G.B.M., Cotton Lge. 7-in. csg. 8,667 ft.; T.D. 10,500 ft.; hole cleaned W.O.O.; P.B. to 7,300 ft.; to sdtrk.; T.D. 7,910 ft.; jetting with gas; comp.; est. 100 B.P.D.

Palacios—Matagorda County

Atlantic Ref. Co. & McCarthy No. 3 Foley Ld. Co., L. Goodwin Sur. 7-in. csg. 8,635 ft.; T.D. 8,900 ft.; tstg.
Sun Oil Co. No. 1 F. K. Robeson, L. Goodwin Sur. Drk.

Orange—Orange County

J. M. Campbell No. 1 Scales, Wm. Dyson Sur. T.D. 5,989 ft.; perf. csg. 5,901-17 ft.; tstd. S.W.
Gulf Oil Corp. No. 1 O. Duhon, Wm. Dyson Sur. Drlg. sh. 1,610 ft.
Ryan & Thompson No. 1 Walter-McGill, Wm. Dyson Sur. Loc.
Shell Pet. Corp. No. 1 E. V. Loeffler, Wm. Dyson Sur. Drlg. sh. 1,812 ft.
Union Prod. Co. No. 2 Lutcher-Moore Dyson Sur. 9⅝-in. csg. 5,162 ft.; T.D. 6,049 ft.; oil sd. 5,965-79 ft.

Segno—Polk County

Gulf Oil Corp. No. 2 Ragan, I.&G.N. Sur. 15. T.D. 6,704 ft.; 9⅝-in. csg. 5,587 ft. drlg. sh. 7,530 ft.
Gulf Oil Corp. No. 6 Wing, I.&G.N. Sur. No. 15. Drlg. sh. 1,812 ft.
Humble O. & R. Co. No. 8-B Kirby, M. Victor Sur. Drlg. 900 ft.

Spurger—Tyler County

Republic Prod. Co.-Houston Oil Co. No. 8 Hurd, N. Hurd Sur. 10¾-in. csg. 2,300 ft.; cg. sh. 7,650 ft.

GULF COAST WILDCATS

Brazoria County

W. H. Christie et al No. 1 J. J. Settegast, F. Green Sur. Drlg. 1,236 ft.
Albert Plummer No. 1 G. C. Street, H. M. Hunter Sur. 10¾-in. csg. 1,232 ft.; drlg. sh. 5,286 ft.
Pure Oil Co. No. 1 Clemons State Farm S. F. Austin 7½ Lge. 7⅝-in. csg. 1,955 ft.; drlg. sh. 6,000 ft.
Texas Co. No. 4 Freeport Sulphur Co., C Arriola Sur. 10-in. csg. 1,214 ft.; T.D. 3,900 ft.; P.B. 2,564 ft.; sdtrkd.; T.D. 3,000 ft.; P.B. to sdtrk.; cd. sd. oil odor 3,539-48 ft.; T.D. 3,894 ft.; P.B. and sdtrkd.; drlg. sh. 3,436 ft.

Burleson County

Red Bank Oil Co. No. 1 Coffield, E. Sante Sur. Drlg. sh.&L. 925 ft.

Chambers County

Geo. Anderson No. 1 Julia Casey, W. D. Smith Sur. Loc.
A. A. Cameron et al No. 1 White, Solmon Brill Sur. R.U.
Leverne Decker et al No. 1 Broussard Trust, sec. 30, H.T.&C. Sur. 10¾-in. 740 ft.; drlg. sh. 4,768 ft.

Fort Bend County

J. R. Spencer No. 1 H. Boyle, Thomas Westfall Sur. Loc.

Harris County

Chapman Mineral No. 1 O. Harris, Wm. Jones Sur. R.U.
W. S. Howell No. 1 Root, A. McCormick Sur. S.D. 2,807 ft.
O. W. Killam No. 1 J. J. Sweeney Est., G. Williams Sur. M.I.M.

Jackson County

Sam G. Harrison No. 1 J. Weodner, J. Williams Sur., Abst. 267. Drlg. sh. 2,836 ft.
Humble O. & R. Co. No. 1 J. R. Davis, I.&G.N. Sur. No. 20, Blk. 150. Drk.
Magnolia Pet. Co. No. 1 West Ranch, R. Musquez Sur. Drlg. sh. 8,110 ft.
H. J. Porter No. 1 J. W. Faust, Peter White Sur. Drlg. S.W. sd. 5,112 ft.

Jefferson County

I. E. Harwell No. 1 State, Gulf of Mexico. S.D. 5,420 ft.
Humble O. & R. Co. No. 1 State, Gulf of Mexico, sec. No. 8. R.U.

Matagorda County

Pierce Est. et al No. 1 Paul Kruger, Nel. C. Warren Sur. Drlg. sh. 7,176 ft.
Sun Oil Co. No. 1 Fred Robbins, C. H. Vandeveer Sur. T.D. 10,160 ft.; well tried to blow out; R.U. to rework.

Polk County

C. E. Gates No. 2 I. O. Jackson, J. W. Abbey Sur. Drk.

Wharton County

H. C. Cockburn et al No. 1 Hudgins, Mudoon Sur. No. 1. Drlg. sh. 2,910 ft.
Strake Pet. Corp. et al No. 1 W. N. Poole, H. J. Fry Sur. Drk.

S. W. TEXAS WILDCATS

Atascosa County

W. M. Allison No. 1 Nieschwietz, J. De La Garza Sur. 216. Spd. and S.D.
S.W.R. Corp. No. 1 Miller, J. Neill Sur. Spd. and S.D.

Bastrop County

J. W. Bibb No. 1 Lentz, F. Wilkenson Sur. Top Austin Chalk with odor of oil 2,530 ft.; 5½-in. csg. 2,443 ft.; S.D. 2,550 ft.
R. C. Franklin No. 2 Yarrington, Jose Manuel Bangs Sur. R.U.

Bexar County

Culver & Bender No. 1 Peterson, H. Virm Sur. T.D. 906 ft.; S.D.
Hamill & Hamill No. 1 Brietzke, Marie Jose Rodriguez Sur. T.D. 1,800 ft.; P.B. 1,595 ft.; abd.
Harrison et al No. 1 Schuwerth, Jose Antonio De La Garza Sur. Drlg. 910 ft.
Hikok & Reynolds No. 1 Eivert, Thomas York Sur. T.D. 1,670 ft.; 7-in. csg. 1,142 ft.; drlg. L. 2,445 ft.
Joe H. Noake No. 1 Oppenheimer, W. Miller Sur. No. 180. 10-in. csg. 17 ft.; drlg. 170 ft.
Chas. Persyn No. 1 fee, Wm. Lindsey Sur. S.D. 1,600 ft.

Caldwell County

Banks Miller Oil Co. No. 1 Martindale, McNeil Sur. 18. Drlg. 1,610 ft.
D. L. Byrd No. 1 Parr, Jas. Hinds Sur., Abst. 125. S.D. 1,036 ft.; T.A.
Mac-Wag-Tree Oil Co. No. 1 Roberts, W. House Sur. 5½-in. csg. 2,517 ft.; T.D. 2,713 ft.; swbd. well; flwd. sulfur wtr.; P.B. to test.
Mencill Pet. Co. No. 1 J. Wallinger, Gedeon Pace Sur. Drlg. 123 ft.

Cameron County

Saxet Prod. Co. No. 1 Port Isabel Irrig. Co. Sur. 30. Drk.

Dimmitt County

Teas & Maryland Corp. No. 1 McKnight, Blk. 13, sec. 23. Base of Austin Chalk 5,201 ft.; top Georgetown L. 6,120 ft.; T.D. 7,116 ft.; S.D. for csg.

Duval County

Atlantic Ref. Co. No. 1 Frank Gravis, E. Gravis Sur., sec. 88. 10¾-in. csg. 747 ft.; cg. sd. 5,008 ft.
Conroe Drlg. Co. No. 1 A. Trevino, J. Poitevent Sur., sec. 1. R.U.
Cown & Sorey No. 1 Taylor, J. Poitevent Sur. 214. T.D. 1,625 ft.; 7-in. csg. 1,644 ft.; swbg. S.W.; S.S.O.; abd.
Frank Gravis No. 1 Megargal, J. Boyles Sur. R.U.
Magnolia Pet. Co. No. 1 Duval County Ranch Co., Sur. No. 195. 10¾-in. csg. 83 ft.; T.D. 3,127 ft.; abd.
Magnolia Pet. Co. No. 1 W. K. Hoffman, sec. 111, S.A.&M.G. Sur. Drlg. sh. 1,802 ft.
Pet. Prod. Co. No. 1 Warden, C.C.S.D.R. G.N.G. Sur. 159. T.D. 1,750 ft.; abd.
Rowan & Hope No. 1 C. K. Gravis, sec. 90. R.U.

Edwards County

Dan Auld No. 1 Henderson, sec. 46, Blk. E. 7-in. csg. 1,865 ft.; drlg. sh. 3,885 ft.

Goliad County

Windward Oil Co. No. 1 Dreier, B.S.&F. Sur. No. 7. 10-in. csg. 1,000 ft.; T.D. 3,637 ft.; D.S.T. 3,632-37 ft.; blew out while drlg. 5,530 ft.; rng. wild.

Guadalupe County

Benstrasser No. 1 Eickenroht, A. Marra Esnaurrezar Sur. R.U.
E. A. Hearn et al No. 1 Dudelof, Jas. D. Clements Sur. S.D. 720 ft.

N. G. Spiller No. 1 Wright Highsmith. Drlg. sh. 1,238 ft.

Hidalgo County

Gulf States Oil Co. No. 1 Cardenas, Juan Jose Balle Sur. 10¾-in. csg. 1,689 ft.; drlg. sh. 4,320 ft.

Hidalgo Prod. Co. No. 1 Daskam Corp., Porc. 45, Blk. 34. Drlg. sh. 1,010 ft.

Jim Hogg County

F. S. Adams No. 1 Martinez, sec. 623. R.U.

Jim Wells County

E. Calloway No. 1 Garcia, R. E. L. King Sur., sec. 54. Drlg.

H. H. Howell et al No. 1 Goldapp, Jose Maria Garcia Sur. T.D. 3,644 ft.; 5½-in. csg. 3,602 ft.; reperf. csg. 3,546-60 ft.; flwg. gas and wsh. wtr. through ¼-in. ck.; C.P. 600 lbs.; S.I.; no ga.

H. H. Howell et al No. 1 Lindsey & Reed, Lavaca Gr. Sur. R.U.

Magnolia Pet. Co. No. 8 Seeligson, A. Rameriz Sur. 13⅜-in. csg. 1,206 ft.; 9⅝-in. csg. 6,155 ft.; drlg. sh. 6,212 ft.

Homer Presnall et al No. 1 Banker Mortgage Co., Jose Maria Garcia Sur. T.D. 651 ft.; W.O.C.

Rowan & Hope No. 2 Adams, T.&N.O. R.R. Sur. T.D. 3,252 ft.; tstd. S.W. 3,-219-20 ft.

Kleberg County

Pure Oil Co. et al No. 1 State Ld., Tr. 68, Laguna Madre Bay, Lse. No. 528. Dredging canal.

Lee County

Elecousse Oil Co. No. 1 Sanders, J. Vin Roeder Sur. T.D. 4,155 ft.; C.O.

Live Oak County

James Chew No. 1 Alma McNeil, Alexander Parks Sur. 7-in. 5,076 ft.; T.D. 5,290 ft.; perf. csg. 5,078-79 ft.; S.O. &G.

Culton et al No. 2 Wedding, Bridget Houghey Sur. Core sdy. sh. 1,227 ft.

Louis Franklin No. 1 Russell, John Hefferman Sur. R.U.

Karotkin & Richardson No. 1 Pape, Wm. R. Conner Sur. R.U.

Ray L. Martin No. 1 Adams, J. Buchannan Sur. Drlg. sh. 1,112 ft.

J. I. Newton No. 1 George West Est., Airy Pieratt Sur. No. 129. Drlg. sh. 957 ft.; no report.

J. P. Payzor No. 1 San Antonio Joint Stock, J. J. Roberts No. 1 Mahone. Drlg. 1,639 ft.

V. G. Schimmel et al No. 1 Geo. West, G. L. Haas Sur. S.D. 210 ft.

McMullen County

Duncan Drlg. Co. No. 1 Martin Henry, sec. 6. S.D. 707 ft.

Mills Bennett Prod. Co. No. 3 Nueces Ld. & Livestock Co., H.T.&B. Sur., Blk. 3. Drlg. sh. 25 ft.

Thad-Day No. 1 Wulf, sec. 77. Drlg. sh. 1,500 ft.

Medina County

Ewing Oil Co. No. 1 Riff, Sur. 42, R.U.

J. R. Trentman et al No. 1 Carle Merc. Co., V. A. Johnson Sur. S.D. 1,400 ft.

Milam County

Texedo Oil Co. No. 1 Graham, Charles Cornea Sur. Logged S.O. 1,135-36 ft.; drlg. L. 1,558 ft.

Texedo Oil Co. No. 1 Paul Garves, C. Robertson Sur. S.D. 1,170 ft.

Nueces County

C. Andrade No. 1 John Dunn, P. Hinojosa Sur. No. 422. T.D. 5,832 ft.; 7-in. csg. on bttm.; tstg.; perf. csg. 5,814-22 ft.; I.P. 5 B.P.H. through 9/64-in. ck.

Corpus Christi Ref. Co. No. 1 J. R. Howington, O. and M. Oliver Sur. No. 156. 10¾-in. csg. 527 ft.; drlg. sh. 4,325 ft.

Renwar Oil Corp. No. 1-A Kennedy, D. Martinez Sur. Drlg. 1,015 ft.

Richardson Pet. Co. No. 2 H. B. Baldwin, E. Villareal Sur. No. 1. Drlg. sh. 5,136 ft.

Refugio County

Barnadall Oil Co. No. 1 C. H. Fagan, Nicholas Fagan. Drlg. sh. 5,230 ft.

Continental Oil Co. No. 1 Scott Hrs., Dona A. Reogas Sur. 10¾-in. csg. 1,-490 ft.; cg. sh. 7,600 ft.

Hogan Oil Co. No. 1 Kelley, M. & A. Roache Sur. T.D. 6,437 ft.; P.B. 6,002 ft.; perf. csg. 5,992-6,006 ft.; flwd. 150 bbls. fluid per day, 15% oil, balance S.W.; well died; R.U. to pmp.

Hogan Oil Co. No. 2 Kelly, J. Powers Sur. S.D. 5,765 ft.

San Patricio County

A. L. Bob No. 2 Green, T. T. Williamson Sur. Cg. sdy. sh. 6,814 ft.

D. W. Moore No. 1 Kelly, J. H. Drummon Sur. Drlg. sh. 6,876 ft.

G. E. Smith No. 1 French, Henry S. Day Sur. Drlg. sh. 4,430 ft.

Starr County

J. L. Collins No. 1 Francisco B. Guerra, Santa Cruz Gr. Drlg. sdy. sh. 6,272 ft.

Scarsborough et al No. 1 Haden, Jose De La Garza Sur. R.U.

Sun Oil Co. No. 2-D Guerra, La Sacatosa Gr., 2 mi. SW of Cuevitas field. R.U.

Victoria County

W. V. Bowles No. 2 Robertson, T. C. Burnham Sur. R.U.

Harry L. Edwards No. 1 Robertson, T. C. Burnham Sur. T.D. 5,624 ft.; P.B. 5,102 ft.; flwg. gas.

Portilla Drlg. Co. No. 1 P. H. Welder, S.A.&M.G. Sur. R.U.

Superior Oil Co. and L. A. Gillespie No. 1 J. Carroll, J. F. Johnson Sur. Drlg. sh. 851 ft.

Webb County

Gilcrease Oil Co. No. 1 Trofton, M. Lopez Sur. 282 ft. 10¾-in. csg. 46 ft.; T.D. 1,945 ft.; fsg.

W. S. Hill No. 1 Adami, A.B.&M. Sur. 345. Core sd. 1,020 ft.

Willacy County

Magnolia Pet. Co. No. 1 Armendaiz, San Juan DeCarricitos Gr., Sh. 4. T.D. 9,-634 ft.; run 9⅝-in. csg.; rmg.

Salvieja Oil Corp. No. 2 Garcia Ld. Co. Blk. 118. Cg. sdy. sh. 6,787 ft.

Zapata County

Falcon Oil Co. 1½ Aquire, Sh. 28-A. S.D. 1,660 ft.

EAST TEXAS

(Border Counties)

Rodessa—Cass County

Bay Oil Co. No. 5 Cobb, G. Crowder Sur. Set 7-in. csg. 6,054 ft.; T.D. 6,119 ft.

Bay Oil Co. No. 2 E. Parker, G. Crowder Sur. Cg. 6,025 ft.

G. H. Chamblee No. 1 White & Walker, R. Potter Sur. Drlg. sh.&L. 4,973 ft.

Magnolia Pet. Co. No. 12 Rives, John Collum Sur. Set 7-in. csg. 6,035 ft.; T.D. 6,047 ft.

Union Prod. Co. No. 5 Bangus Unit, Tromwell Sur. Set 7-in. csg. 5,994 ft.; T.D. 6,007 ft.; comp.; 115 B.P.D.; open tbg. and flow valves.

G. H. Vaughn No. 1 Riley, J. Taylor Sur. D.&A. 6,290 ft.

Bowie County

King Oil Corp. No. 1 Watts, Geo. Brinlee Sur. Drlg. 2,107 ft.

Cass County—Other

Vincent Hughes No. 1 P. C. Lyster, Bateman Sur. T.D. 4,400 ft.; set csg.; W. O.C.

Harrison County

Ark.-La. Gas Co. No. 1 C. M. Abney, E. Little Sur. T.D. 4,820 ft.; set 7-in. csg. 2,350 ft.; drlg. ahead.

Marion County—Rodessa

Ark.-La. Gas Co. No. 1 Hill, Gillespie Sur. Drlg. 1,747 ft.

Arkansas-Louisiana Gas Co. No. 1 Hollands, Hanks Sur. Set 7-in. csg. 6,092 ft.; T.D. 6,121 ft.; tstd. S.W. and small S.O. at 6,121 ft.; arrng. P.B. 6,112 ft.; tstg.

Ark.-La. Gas Co. No. 2 Holland, Hanks Sur. R.U.

Ark.-La. Gas Co. No. 1 Howard, Thos. Gillespie Sur. Drlg. anhy.&sh. 5,510 ft.

Ark.-La. Gas Co. No. 1 Pitts, C. Lockhart Sur. Drlg. L. 4,232 ft.

Geo. Barham No. 1 Beard, R. Bennington Sur. Drlg. anhy.&sh. 5,618 ft.

Dunn & Fisher No. 1 Neilson, Gentry Sur. Drlg. sh.&L. 3,276 ft.

Dunn & Fisher No. 1 G. F. Whitfield, Bennington Sur. Drlg. L.&sh. 3,684 ft.

Geo. Echols No. 1 Whitfield, R. Bennington Sur. Cg. 6,082 ft.

Flesh & Hootkins No. 1 Whitfield, Bennington Sur. Drlg. L. 5,805 ft.

Gulf Oil Corp. No. 3-A Henderson, Bennington Sur. Set 7-in. csg. 6,009 ft.; T.D. 6,036 ft.

Gulf Oil Corp. No. 1-A Ray, Hanks Sur. Rng. csg. 6,081 ft.

Heyser, Heard & Clardy No. 1 Brantley, Bennington Sur. Drlg. sh.&L. 4,-364 ft.

Heyser, Heard & Clardy No. 2-B Henderson, Ewing Sur. Drlg. sh.&sd. 4,-046 ft.

Hollandsworth Drlg. Co. No. 2 Hill, Smith Sur. Drlg. sdy. L. 5,973 ft.

Phillips Pet. Co. No. 1 Benefield, Hanks Sur. Drlg. L.&sh. 5,320 ft.

Phillips Pet. Co. No. 1 Denton, Coy Sur. T.D. 6,183 ft.; set 7-in. csg.

Phillips Pet. Co. No. 1 Henderson, Gillespie Sur. Drlg. sh.&L. 4,456 ft.

J. C. Robbins et al No. 1 J.&N.W. Ry., Bennington Sur. Drlg. L.&sh. 3,270 ft.

Shell Pet. Corp. No. 1 Schluter, W. Smith Sur. Drlg. 400 ft.

Shell Pet. Corp. No. 1 Whelan, Thos. Gillespie Sur. Drlg. L.&sh. 4,981 ft.

Union Prod. Co. No. 6 Hutchinson, Coy Sur. Drlg. sh.&L. 4,173 ft.

Panola County

Logansport P. L. Co. No. 1 Rushing Est., Smith Sur. Drlg. 3,215 ft.

H. E. Preston et al No. 1 Rushing Est., Manning Smith Sur. T.D. 3,028 ft.; M.I. rig.

Texas Co. No. 1 Claude Adams, T. Cox Sur. Drlg. 5,872 ft.

WEST TEXAS WILDCATS

Andrews County

J. Donnelly et al No. 1 University, sec. 16, Blk. 14, University Sur. Moving in rotary 190 ft.

Humble O. & R. Co. No. 1 Kuykendall, sec. 24, Blk. 46-A, P.S.L. Sur. P.B. 4,473 ft.

Rogers & Rogers No. 1 O. B. Holt, P.S.L. Sur. Tstg. 4,541 ft.

Seaboard Oil Corp. No. 1 Munger-Nix, sec. 1, Blk. A-4, P.S.L. Sur. Tstg. 4,-541 ft.

Seaboard Oil Corp. No. 1 Thornberry, sec. 8, Blk. 42-A, P.S.L. Sur. W.O.C. 169 ft.

H. C. Wheeler No. 1 T. M. Gardner, sec. 15, Blk. A-35, P.S.L. Sur. Drlg. 1,613 ft.

Bailey County

Duffey & Etz No. 1 Enochs, Tract 68, League 182, Floyd Co. School Lands Sur. M.I.S.T. 4,160 ft.

Brewster County

F. C. Dodson No. 1 Texas American Synd., sec. 66, Blk. 10, G.H.&S.A. Sur. Fsg. 7,415 ft.

Storey No. 1 Wilson, sec. 3, Blk. 212, T.&St.L. Sur. S.D. 2,545 ft.

Cochran County

J. R. Meeker et al No. 1 Wright, Mills City Sch Ld. Drlg. plug 4,930 ft.

Texas Co. No. 1 Mallett Ld. & Cattle Co., sec. 7, Blk. G, P.S.L. Sur. C.&P.

P. N. Wiggins et al No. 1 Dean, NE cor. League 58, Martin Co. School Lands Tstg. 5,077 ft.

Coke County

Barnett Pet. Co. No. 1 J. R. Mims, sec. 35 Blk. W, T.&P. Sur. Drlg. 1,685 ft.

H. E. Ogden et al No. 1 Rawlins, sec. 390 Blk. B-21. Tstg. 2,690 ft.

Concho County

Barnett Oil Dev. Co. No. 1 Sims, Abst. 851, Carl Thiele Sur. S.D. 162 ft.

Sam Murray No. 1 R. G. Armor, sec. 105, T.&N.O. Sur. S.D. 495 ft.

Cottle County

Wilcox O. & G. Co. No. 1 Richards et al, sec. 761, Blk. Y, W.&G. Sur. S.D. 275 ft.

Culberson County

Grisham Hunter No. 1 Caldwell, sec. 14, Blk. 42, P.S.L. Sur. Drlg. 325 ft.

Crockett County

Moore Bros. No. 1 Perner, sec. 37, Blk. 2, I.&G.N. Sur. Drlg. 9,086 ft.

J. N. Simpson No. 1 Hoover, G.C.&S.F. Sur. Drlg. bridge 1,931 ft.

Stewart & Cormas No. 1 Hoover, sec. 1, Blk. FF, B.B. Sur. W.O.C. 1,931 ft.

Culberson County

Grisham & Hunter No. 1 fee, sec. 14, Blk. 42, P.S.L. Sur. M.I.S.T.

Dawson County

Albaugh No. 1 Robinson, E.L.R.R. Sur. T.D. 5,038 ft.; tstg.

Atlantic No. 1 Scanlan, sec. 83, Blk. M, E.L.R.R. Sur. P.B. from 4,965 ft. to 4,932 ft.; S.D. 4,932 ft.

Ector County

Bodins et al No. 1 Edwards, Drlg. 4,600 ft.

Melhoan Drlg. Co. No. 1 Gulf Blakeney. Cg. 4,118 ft.

Stogner et al No. 1 Hendrick, sec. 4, Blk. 43, T.&P. Sur. Loc.

L. H. Wentz Oil Co. No. 1-B Parker. P.B. 4,210 ft.

Wentz Oil Co. No. 2-D Parker. S.D.O. 4,882 ft.; C.O. 800 ft.; O.I.H.

Edwards County

A. P. Carter No. 1 F. D. Sweeten, B.&B. Sur., 2 mi. E of Rock Springs. Drlg. 6,301 ft.

Lyles & Dan Auld No. 1 Henderson, H.E. &W.T. Sur. S.D. 3,200 ft.

Richmond Drlg. Co. No. 1 Brown, G.W. T.&P. Sur. S.D.O. 5,750 ft.

El Paso County

Tri-State Oil Co. No. 1 Kinkel. Prep. run tbg. 3,571 ft.; S.D.

Fisher County

Daniel & Rhodes No. 1 Nichless, Geo. W. Lawrence Sur. S.D. 3,340 ft.

General Crude Oil Co. No. 1 Morrow, sec. 185, Blk. 2, H.&T.C. Sur. Drlg. 3,-537 ft.

Southern Oil Co. No. 1 Bocat, H.&T.C. Sur. S.D.O. 4,016 ft.

Floyd County

Mills Bennett No. 1 T. Montgomery, F. J. Latham Sur., 6 mi. S of Floydada. T.D. 5,082 ft.; fsg.

Gaines County

Amerada Pet. Corp. No. 1 R. W. Robertson, sec. 196, Blk. G, W.T.R.R. Sur. Drlg. by tools 5,112 ft.

Continental No. 1-45 Moore, sec. 45, Blk. AX, P.S.L. Sur. Drlg. 4,735 ft.

M. B. K. Drlg. Co. No. 1 A. L. Wasson, sec. 52, Blk. AX, P.S.L. Sur. Drlg. wtr. well.

Shell Pet. Corp. No. 1 M. B. Robinson, sec. 344, Blk. G, C.C.S.D.&R.G.N.G. Sur. Drlg. 5,102 ft.

Garza County

Gulf Oil Corp. No. 1 Swanson, sec. 25, Blk. 2, H.&G.N. Sur. Drlg. 1,522 ft.

Glasscock County

O. B. Greathouse No. 1 Burns, sec. 221, Blk. 29, W.&N.W. Sur. M.I.S.T.

O. B. Greathouse No. 1-211 Burnes, sec. 211, Blk. 29, W.&N.W. Sur. Loc.

Hockley County

Gulf Oil Corp. No. 1 M. G. Gordon, sec. 12, Blk. X, P.S.L. Sur. Drlg. 4,880 ft.

Gulf Oil Corp. No. 1 Mallett Ld. & Cattle Co., sec. 6, Blk. X, P.S.L. Sur. Drlg. 4,757 ft.

Honolulu Oil Co. No. 1-51 Dorthy Slaughter, Labor 51, League 37, Zavalla Co. Sch. Lds. Tstg. 4,970 ft.

Honolulu Oil Co. No. 1-77, Labor 77, League 37, Zavalla Co. Sch. Lds. Drlg. 2,926 ft.

Howard County

Lockhart Oil Co. No. 1 Hussinger, sec. 67, Blk. 29, W.&N.W. Sur. P.B. 2,875 ft.; tstg.

W. F. McDermott et al No. 1 Lucas, sec. 18, Blk. 29, Twp. 1n, T.&P. Sur., 5 mi. N of Dodge pool. Drlg. 3,077 ft.

Hudspeth County

Haymon Krupp Oil & Ld. Co. No. 1 Thaxton, SE¼ sec. 34, Blk. 74, Twp 6, T.D. 4,162 ft.; underreaming 4,148 ft.

Haymon Krupp No. 1 Briggs, sec. 24, Blk. 73, Twp. 7, T.&P. Sur. Drlg. 3,750 ft.

Jeff Davis County

Joiner Oil Corp. No. 1 Jones-Coffield. S.D. 3,500 ft.

Kent County

Thad A. Bryant Jr. No. 1 Haggins et al, sec. 118, Blk. 1, H.&G.N. Sur. Bldg. drk.

Thad A. Bryant, Jr., No. 1 House, sec. 10, Blk. 1, H.&G.N. R.R. Sur., 6,000-ft. test. Drlg. 200 ft.

Kerr County

A. E. Edmiston et al No. 1 J. H. Saul, sec. 47, T.W.N.G. Sur. Spdg.

Lamb County

Toddie L. Wynne, Tr. No. 1 Neuenschwander, Labour 1, League 660, State Cap't. Lds. S.D.; drill pipe stuck 3,295 ft.

Loving County

Barnett Pet. Co. No. 1-A Johnson, sec. 2, Blk. 57, Twp. 1, T.&P. Sur. Drlg. 3,-900 ft.

Bryant-Caraway et al No. 1 House, Pre-Emption Sch. Lds., sec. 10. Setting surface csg.

Carpenter & Grierson No. 1 Mrs. Bennie Barnes, sec. 22, Blk. C-25, P.S.L. Sur. Loc.

Lynn County

John L. Baldridge No. 1 Alma Lbr. Co., sec. 151, H.E.&W.T. Sur. Drlg. 4,310 ft.

McCulloch County

Westbrook et al No. 1 Johnson, A. Nevendorf Sur. S.D. 1,836 ft.

Martin County

Harris-Anderson Oil Corp. No. 1 Mollie Robinson, sec. 33, Blk. 38, T.&P. Sur. S.D. 4,189 ft.

Menard County

G. A. Clements No. 1 Murchison, sec. 80. B.S.&S. Sur., 8 mi. E of Menard. Tstg. 1,270 ft.

C. D. Haggerty No. 1 Callon, sec. 36, Jim Franz Sur. Spud. and S.D.

Pecos County

Harry Baker et al No. 1 White & Baker, sec. 53, Blk. 194, C.C.&S.F. M.I.M.

J. J. Dorr et al No. 2 Payton, sec. 99, Blk. 8, H.&G.N. Sur. Cellar and pits.

Ed Falney No. 1 Trees, sec. 63, Blk. 8, H.&G.N. Sur. Fsg. 2,055 ft.

Magnolia Pet. Co. No. 1 McKee. Running tbg. 5,330 ft.

S. Thompson No. 1 Elsinore Cattle Co., sec. 54, Blk. D, G.C.&S.F. Sur. Fsg. 7,212 ft.

Trans-Pecos Oil Co. No. 1 Gallagher, T.&P. Sur. S.D. 1,610 ft.

Trans-Pecos Oil Co. No. 3-A Papham, G.H.&S.A. Sur. S.D. 1,934 ft.

Wilcox O. & G. Co. No. 1 Serf, sec. 27, Blk. 130, T.&St.L. Sur. Drlg. 2,560 ft.

Presidio County

L. C. Brite No. 4 fee, C NW¼ sec. 113, Blk. 12, G.H.&S.A. Sur. Fsg. 4,380 ft.

Reeves County

Barnett Pet. Corp. No. 1 Ely, sec. 38, Blk. 71, P.S.L. Sur., 12 mi. NW of Toyah. S.D. 4,223 ft.

Grisham Hunter Corp. & N. A. Grisham No. 1 Geo. Daniel, sec. 40, Blk. 58, T.&P. Sur. S.D. 730 ft.

Ohio Oil Co. No. 1 Papham, sec. 18, Blk. 54, T.&P. Sur. Drlg. 1,780 ft.

Runnels County

E Z Oil Co. No. 1 B. Fletcher, E. C. Good Sur. T.D. 4,394 ft.; P.B. to 4,360 ft.; S.D.O. 4,384 ft.

Stevens & Glober No. 1 Fowler, sec. 150, E.I.R.R. Sur. S.D. 1,095 ft.

Schleicher County

J. M. Cooper No. 2 B. Page, sec. 40, Blk. L, G.H.&S.A. Sur. S.D. 5,004 ft.

Tex-Tor Oil Corp. No. 1 Judkins & Spencer, C of SW¼ sec. 33, Blk. A, A.&B. Sur. Drlg. 6,320 ft.

Scurry County

Robinson Drlg. Co. No. 1 Martin, sec. 147, H.&T.C. Sur. S.D. 3,513 ft.

T. G. Shaw Oil Co. No. 1 First Natl. Bank. Fsg. 2,420 ft.

Sterling County

J. W. Sward No. 1 Brennand, sec. 107, Blk. 2, H.&T.C. Sur. Drlg. 735 ft.

Stonewall County

Bert Fields No. 1 J. M. Lee, J. E. Pierson Sur. Loc.

General Crude Oil Co. No. 1 J. D. Smith, sec. 371, Blk. 2, H.&T.C. Sur., 12 mi. N Rotan. Drlg. 2,830 ft.

Swanson & Parriott No. 1 H. T. Carlisle, sec. 293, Blk. D, H.&T.C. Sur. Drlg. 2,787 ft.

Sutton County

A. A. Basse and S. J. Sackett No. 1 W. A. Miers, sec. 54, Blk. 14, T.W.&N.G. Sur. S.D. 55 ft.

Ordovician Oil Co. No. 1 Evans, sec. 1, L. Stubblefield Sur., 32 mi. SE of Sonora. Drlg. 4,125 ft.; topped Ellenburger 4,085 ft.

Terrell County

D. & S. Oil Co. No. 1 Sam Bell. Drlg. 960 ft.

Tom Green County

Humble O. & R. Co. No. 1 Lewis & Wardlaw, sec. 5, Blk. 17, H.&T.C. Sur. Drlg. 6,979 ft.

Southern Cross Oil Co. No. 1 J. W. Wilson, sec. 30, Blk. H, A.B.&M. Sur. Loc.

Spinner No. 1 Reed, Mason Ferry Ranch Sur. C.O. 3,750 ft.

Upton County

Holland & Maverick No. 1 Faiff, sec. 6, Blk. H, C.C.S.D.&R.G.N.G. Sur. Drlg. 795 ft.

W. D. Riser et al No. 1 King Ranch Oil & Lignite Co., sec. 8, Blk. 3, M.K.&T. Sur. S.D. 730 ft.

Rutter et al No. 1 Egolb, sec. 5, J. H. Gibson Sur. Blg.; T.D. 3,294 ft.; S.D.O. 3,295 ft.

J. S. Pitman No. 1 D. Elder, C.C.S.D.& R.G.N.G. Sur., Blk. 3, sec. 14. S.D.O. 3,065 ft.

Ward County

Cities Service No. 2 Brandenburg, sec. 4, Blk. 32, H.&T.C. Sur. Prep. run tubing 2,096 ft.

M. J. Delaney No. 1 J. E. Cooper, H.&T.C. Sur. Tstg. 2,092 ft.

J. E. Fitzpatrick et al No. 1 H. B. Carr sec. 125, Blk. 34, H.&T.C. Sur. Drlg. 1,093 ft.

J. E. Fitzpatrick et al No. 1 F. K. Dyer sec. 135, Blk. 34, H.&T.C. Sur. Drlg. 1,680 ft.

Hoss & Downey No. 1 Meyers, sec. 17, Blk. 32, H.&T.C. Sur. Spd. and S.D.

Hoss & Downey No. 1 Ross Avery, sec. 36, Blk. 1, H.&T.C. Sur. Drlg. 1,700 ft.

Patillo & Webster No. 1 Johnson. Tstg. 1,990 ft.

Sayre Oil Co. No. 1 Bertner, sec. 34, Blk. 1, H.&T.C. Sur. Drlg. 240 ft.

O. E. Schkode No. 1 Boogher, sec. 1, Blk. 32, H.&T.C. Sur. Drlg. 160 ft.

L. F. White et al No. 1 Rector-Monroe, E cor. sec. 3, Blk. 1, W.&N.W. Sur. S.D. 4,710 ft.

Winkler County

Ed. L. Gelder No. 1 R. D. Kessler & F. Kessler, sec. 14, Blk. B-3, P.S.L. Sur. Loc.

Yoakum County

Bahago & Bond Oil Corp. No. 1 J. L. West, sec. 607, Blk. D, J. H. Gibson Sur. S.D.O. 5,393 ft.

Gulf No. 1 J. C. Futch, sec. 796, Blk. D, J. H. Gibson Sur. Drlg. plug. 4,700 ft.

Humble No. 1 Abilene State Bank, sec. 37, Blk. AX, P.S.L. Sur. Tstg. 5,005 ft.

Ohio No. 1 Claywater, sec. 638, Blk. D, J.H. Gibson Sur. R.U.R.

Shell No. 1-C Baumgart, sec. 866, Blk. D, J. H. Gibson Sur. Tstg. 5,018 ft.

Texas Co. No. 1 Walker, sec. 794, Blk. D El. 3,656 ft.; T.D. 5,180 ft.; P.B. 5,162 ft.; S.D. 5,162 ft.

Stogner & Pipkin No. 1 Blade, J. H. Gibson Sur. S.D.O. 5,307 ft.

E. C. TEXAS WILDCATS

Anderson County

Tide Water-Seaboard No. 2 J. Reagan, J. Adams Sur. R.U.

Angelina County

J. C. Bonham No. 1 Cameron Lbr. Co., E. Miller Sur., 3 mi. SE of Zavalla. Cg. 1,500 ft.

Ginter Co. No. 3 Copes Heirs, J. Morin Sur., 4 mi. E of Dibol. Drlg. plug. 2,200

C. E. Parrott No. 1 J. C. Burres, W. Plucker Sur., 2½ mi. W of Huntington. Drlg.

Cherokee County

J. G. Mayo et al No. 1 J. H. Bowlery, W. H. Walters Sur. Drlg. 2,900 ft.

Merica Oil Co. No. 1 Cherokee Dev. Co., A. J. Acker Sur., 2 mi. E of Maydelle. Drlg. 5,022 ft.

Dallas County

Plaza Oil Co. No. 1 Davidson, Marchants Sur., 1 mi. NW of Seagoville. S.D. 1,820 ft.

Falls County

McCleod et al No. 1 F. Bolton, J. R. Cockrill Sur., 4 mi. NW Rosebud. Fsg. 1,708 ft.

Franklin County

White-McGee & Harper No. 1 Harper, W. N. Dawson Sur., on Franklin-Hopkins Co. line, 6 mi. SW of Hagansport. R.U.

Freestone County

C. E. Rossiter No. 1 J. P. Fulton in J. P. Fulton Sur., 2½ mi. E of Donie. S.D. 956 ft.

Gregg County

Humble O. & R. Co. & Gulf O. Corp. No. 1 E. Robertson, M. Mann Sur., 2½ mi. SW of Longview Trinity test. El. 275 ft.; drlg. 8,972 ft.

Henderson County

Howard Pet. Co. No. 1 H. W. Barton, A. J. Allen Sur. S.D. 350 ft.

S. B. Howard et al No. 1 T. C. Self, F. Brown Sur., 3 mi. SW of Athens. R.U.

Jones-Mallory No. 1 A. Mallory, T. S. Mitchell Sur., 6 mi. SW of Mabank. W.O.C. 107 ft.

Hill County

J. Willis No. 1 W. P. Ball, S. Marshall Sur., 3 mi. NW of Covington. M.I.M.

Houston County

Peyton Bros. No. 1 J. N. Daniels, J. M. Procella Sur., ½ mi. N of Procella. Drlg. plug. 404 ft.

Lamar County

Cooper Bros. No. 2 L. B. Hayes, L. Roberts Sur. Loc.

Leon County

Lone Star Gas No. 1 Sarah Melasky, 1 mi. S of Buffalo pool. Tstg. 5,828 ft.

Limestone County

C. L. Brown No. 27 N. B. Boyd, R. B Longbotham Sur., 3 mi. S of Wortham T.D. 1,402 ft.; oil sd.; S.D.W.O. 1,455 ft.

J. S. Cosden, Jr. No. 1 J. J. Bower, J. Breeding Sur., near Prairie Hill. S.D. 460 ft.

Stanolind O. & G. Co. No. 1 T. Norris, in Thresher Sur., 5 mi. N of Kosse; 6,500 ft. test; elev. 528 ft.; S.D.W.O. 9,951 ft.

McLennan County

Chapman & Kahn No. 1 Carl Hartsman, B. C. Walters Sur., 1½ mi. S of McGregor. Drlg. 810 ft.

Kilgore No. 1 J. M. Marrs, J. S. Rutland Sur., 2 mi. S of Bosque. S.D. 1,000 ft.

Navarro County

G. W. Gibson No. 1 J. H. Edgar, M. Meazel Sur., 2½ mi. S of Richaland. R.U.

Natural Pet. Co. No. 1 Karen Brown, W. T. Turner Sur., 2 mi. E of Roane. S.D. 1,735 ft.

Mrs. Jane Robinson No. 1 Fortson Bros., Eli Smith Sur., 5 mi. NE Corsicana. Cg. 2,453 ft.

I. Sharpe et al No. 1 E. B. McDowell, T Jordan Sur., 1½ mi. S of Bassets. S.D. 3,160 ft.

Smith County

H. L. Hunt et al No. 1 S. H. Bradly, T. P. Payne Sur., 10 mi. E of Tyler at Chappel Hill. Drlg. 90 ft.

Mayo-Houah & Thompson No. 1 J. B. Mayfield, Wm. Keys Sur., 4 mi. SE of Tyler. Drlg. 1,500 ft.

Titus County

Lee Umbernhour No. 1 J. M. Sykes, J. Mathews Sur., 1 mi. N of Winnsboro. Setting surface pipe.

Trinity County

Bilinoski et al No. 1 Trinity State Bnk., B. F. Wright Sur., 2 mi. S of Trinity. S.D. 120 ft.

Upshur County

Tom Hunter and American Liberty No. 1 J. P. Carter, J. H. Fields Sur. S.D. W.O. 7,933 ft.

NORTH TEXAS WILDCATS

Archer County

A. H. Bedinghaus No. 1 J. L. Anderson, Blk. 23, S.A.R. Sur. 10-in. 80ft.; W.O.C.

Hull & Silk No. 1 L. F. Wilson, sec. 25, A.T.N.C.L. Sur. 6⅝-in. 3,830 ft.; O.S. 3,841-58 ft.; W.O.C.

Kilgore-Luginbyhl & Johnson No. 1 Ford, T. M. Cecil Sur. A-982. 10-in. 100 ft.; W.O.C.; 4,500-ft. test.

Wayne King et al No. 1 C. A. Arthur, sec. 3, G.H.&H. Sur. A-158. S.D. 210 ft.

Lewis Prod. Co. No. 1 W. C. Frey, sec. 17, P.P.S.L. Sur. 6⅝-in. 3,978 ft.; sdy. L. 3,973-82 ft.; test showed oil; T.D. 4,005 ft.; S.D.O.

Baylor County

D. S. Kelly No. 1 W. T. Waggoner, sec. 54. T.&N.O. Sur. S.D.O. 1,200 ft.

Wilcox O. & G. Co. No. 1 W. H. Portwood, T.E.&L. Sur. Loc.; 6,000-ft. test.

Clay County

Barnett Pet. Co. No. 1 Ben Nutter, sec 30, Grayson Co. Sch. Lds. S.D. 4,087 ft.

Deep Oil Dev. Co. No. 1 C. H. McClellan, Chas. F. Stanley Sur. A-407. Drlg. 1,850 ft.

Wirt Franklin et al No. 1 Staggs, sec. 34, A.G.S.L. Sur. 12½-in. at 130 ft.; drlg. 4,095 ft.

Walter Gant No. 1 Bryant Edwards, S. C. Beldon Sur. A-12, 6,000-ft. test. Drlg. 2,075 ft.

Healdton O. & G. Co. No. 1 Wallace, Belcher Subd. Drlg. 4,518 ft.

W. P. Luse No. 1 Hapgood, sec. 68, Marion Co. Sch. Ld. Drk.; 5,000-ft. test.

Wood Pet. & Roy. Corp. No. 1 I. H. Kempner, Blk. 44, Bosque Co. Sch. Ld. Sur. A-10. Cmt. 10-in. surf. csg.; W.O.C.

Cooke County

H. L. Nutting et al No. 1 H. P. Ware, A.C.C. Bailey Sur. A-44. 6⅝-in. 2,214 er Subd. Drlg. 4,518 ft.

Sunset Oil Co. No. 1 J. T. Donald, S.P. R.R. Sur. A-971. Spudding; 3,500-ft. test.

Denton County

W. C. Curry et al No. 1 G. F. Owens, N. Rudder Sur. A-1.060. S.S.O. 1,570-80 ft.; S.S.O. 2,212-16 ft.; test show oil and water; S.D.O.

Foard County

Texas Co. No. 16 Johnson, sec. 37, S.P. R.R. Sur. Drk.

Jack County

Auers et al No. 1 Garrison, W.C.R.R. Sur. A-960. 7-in. 2,830 ft. by Schlumberger; T.D. 3,200 ft.; tstg. S.S.O. 2,837-50 ft.; S.D.O.; may D.D.

Butler & Horn No. 1 Henderson, S.P. R.R. Sur. A-565. Spudded; 3,500-ft. test.

G. M. Gillespie No. 1 A. M. Street, sec. 3339, T.E.&L. Sur. U.R. 8¼-in. 2,215 ft.; drlg. 2,670 ft.

Van Eman & Richards No. 1 Whitsell, Wm. McElroy Sur. A-599. Fsg. 3,235 ft.

Montague County

H. H. Powell No. 1 Arch Durham, W. J Wagoner Sur. A-936. S.D. 411 ft., weather.

J. W. Sorrell et al No. 1 J. E. Walthall, Sam. H. Smith Sur. A-662. S.D.O. 2,720 ft.

Wichita County

Bolin & Whittington No. 1 Waggoner Bros., sec. 21, H.&T.C. Sur. Sdy. L. 3,840-62 ft. showing oil; running 6⅝-in. csg.

Grace & Wood No. 1 Williams, sec. 13, Tarrant Co. Sch. Ld. Drlg. 3,795 ft.

V. A. Huff No. 1 C. F. Collins, J. T. Tyler Sur. A-568. 6⅝-in. 4,285 ft.; O.S. 4,302-09 ft.; T.D. 4,318 ft.; drlg. plug.

J. S. Graham No. 1 E. M. Goetze, sec. 2, W.C.R.R. Sur. A-444. Loc.; 4,000 ft. test.

West & Medders No. 1 Williams, sec. 25, H.&G.N. Sur. A-155. Drlg. 2,785 ft.

F. W. Merrick, Inc., No. 1 W. T. Waggoner, sec. 35, H.&T.C. Sur., Blk. 5. Top Ellenburger 3,745 ft.; S.L. 3,733-3,802 ft.; 6⅝-in. 3,740 ft.; S.L. 3,733-3,802 ft.; drlg. plug.

E. T. Noble No. 1 K. P. Abernathy, sec. 9, T.C.S.L. Sur. A-282. Drlg. 3,970 ft.

E. J. Stump No. 1 M. P. Bishop, L. Netherly Sur. A-240. S.D.O.; S.L. 3,885-3,997 ft.

Wilbarger County

Loyd H. Brown No. 1 W. T. Waggoner, sec. 33, Blk. 6, H.&T.C. Sur. 7-in. 4,075 ft.; drlg. 4,125 ft.; no saturation.

N. Gilbert No. 1 McGill, sec. 3, Blk. 9, H.&T.C. Sur. U.R. 7-in. 3,300 ft.; C.O. 3,752 ft.

E. C. Lawson No. 1 Ruitsch, sec. 21, H. &T.C. Sur., Blk. 9. Drlg. 1,315 ft.

Phillips Pet. Co. No. 1 W. T. Waggoner "Barger," sec. 11, H.&T.C. Sur., Blk. 14. 7-in. 2,850 ft; L.S.O. 2,850-60 ft.; drlg. 3,300 ft. lime.

Young County

Anzac Oil Corp. No. 1 E. S. Graham, A. Hines Sur. A-135. T.D. 4,000 ft.; tstg. L. 3,990-98 ft.

N. B. Crenshaw No. 1 J. C. Dwight, sec. 1,444, T.E.&L. Sur. S.D. 400 ft.

Howard Pet. Co. No. 1 G. R. Stewart, sec. 84, C.S.L. Sur. Drlg. 4,150 ft.

Kadane-Griffith No. 1 Sanders, sec. 1989, T.E.&L. Sur. Drlg. 2,900 ft.

A. N. Nunhall No. 1 Ed Johnson, A. McLennan Sur. A-185. Drlg. 175 ft.; 5,000-ft. test.

RANGER (CENTRAL TEXAS) DISTRICT

Callahan County

Joe Gallagher No. 1 W. T. Harris, 200 ft. from S line, 1,050 ft. from E line sec. 347, G. W. Denton Sur. 2,000-ft. test, 5 mi. N Oplin.

J. H. Howell No. 1 E. I. Vestal, 1,149 ft. E line, 1,000 ft. N line, Jesse Dyson Sur., 2 mi. NE Cross Plains, rotary to 4,000 ft. Surf. to 100 ft.; drlg. 550 ft.

Hal Hughes No. 1 Poindexter, sec. 350, Geo. Hancock Sur., 2 mi. NE of Oplin Set 7-in. 3,870 ft.; est. 1,000,000 ft. gas lime 4,368-89 ft., T.D., S.L.M.; est. 300 B.O.P.D.; 5-in. set 4,358 ft.; acid. 3,000 gal.; flowing est. 1,000 B.O.P.D. with 5,000,000 ft. gas; flowed 896 B.O. in 9 hrs. thru ⅝-in. choke.

J. C. Jackson et al No. 1 Thompson, 2 mi S. Eula, sec. 30, B.B.B.&C. Sur. S.D. 1,955 ft.

Wittmer Oil & Gas Properties, Inc., No. 1 R. D. Williams et al, 300 ft. from N line, 467 ft. from W line sec. 2,269, T.E.&L. Sur., 2 mi. NE Putnam, 4,500-ft. test. Drlg. 600 ft.

Coleman County

J. F. Brock No. 1 J. H. Livingston, SE cor. SW¼ county, J. D. Waters Sur. No 208. S.D. 1,070 ft.

Garrett Oil Co. No. 1 W. S. Smith et al., 4 mi. SE Coleman, J. Thiele Sur. 2,300-ft. test.

Comanche County

N. D. Gallagher et al No. 1 Mrs. B. I Terry. Desdemona pool, N. H. Kuykendall Sur. S.O. in Ellenburger; drlg. 4,815 ft.

Dobbs Oil Co. No. 1 Hodges, sec. 11, Blk 2, H.&T.C. Sur., T.D. 2,710 ft:; acid. 4,000 gal. 2,630-62 ft.; bldg. tanks.

Eastland County

G. D. Chastain et al No. 1 Weddington, 4 mi. N. Cisco, sec. 496. S.P.R.R. Sur. T.D. 4,079 ft.; plugging back.

Hickok Prod. & Dev. Co. No. 1 J. E. Donovan, 5 mi. NW of Cisco, 660 ft. from N and E lines of NW¼ sec. 489, S.P. R.R. Sur. Top Ellenburger 4,247 ft.; trt. 1,000 gal. and 10,000 gal. acid; no results; drlg. past 4,310 ft.

Lone Star Gas Co. No. 1 M. Thomas, 5 mi. NW of Cisco, 668 ft. from N line and 660 ft. from E line of SE¼ sec. 478, S.P.R.R. Sur. Top Ellenburger 4,119 ft.; top pay 4,156 ft.; flowed 1,183 B.O. in 24 hrs.; comp.

Neil A. Moore No. 7 Holcomb Heirs, 970 ft. from W line and 600 ft. from N line, SW¼ 1-4, H.&T.C. Sur. Loc.

Fisher County

Forest Dev. Corp. & Daube No. 1 L. G. Bennett, 660 ft. from N & E lines, sec. 51-3, H.&T.C. Sur. Rotary to 4,500 ft.; 3 mi. SW of Rotan.

Owens-Snebold & A. C. Varner No. 1 J. H. Milsap, 3,500-ft. wildcat, 2 mi. NW McCaulley. 330 SL 330 WL, sec. 61-2, H.&T.C. Sur. Drlg. 927 ft.

Haskell County

Fain-McGaha Oil Corp. No. 1 T. G. Hendrick, C W½ sec. 104, Indianola Rv. Sur. Set 150 ft. of 12½-in.; drlg. 1,375 ft.

J. W. and A. E. McMillan No. 1 A. E. Pardue, 440 ft. from N and W lines, S½ M. Collum Sur. No. 4 A-685. Rotary to 3,500 ft.

Superior Oil Corp. No. 1 T. G. Hendrick, 330 ft. S line, 330 ft. E line, N½ sec. 9, A. Rodriguez Sur., rotary to 3,500 ft Dry and abd.; T.D. 3,254 ft.; plugging.

Jones County

J. S. Bridwell No. 1 C. L. Carter, 220 ft. from N and E lines SW SE section 37-15, T.&P. Sur. S.S.O. 1,890 ft.; drlg. 1,990 ft.

Jack Burleson No. 1 T. J. Lotspeich, 220 ft. from S and E lines of sec. 40-15, T.&P. Sur. S.D. at 2,146 ft.

Danciger No. 1 Hugh E. Roberts, 220 ft. from S and W lines, E 110-ac., NE¼ sec. 37-15, T.&P. Sur. Top sd. 1,922 ft.; T.D. 1,946 ft.; shot 40 qts.; W.O.C.

W. W. Fondren No. 1 Cox-Manley, 330 ft. from S line and 330 ft. W of C of S line of C. B. Sheppard Sur. 70. Spd.

F. A. Gillespie & Sons No. 1 J. N. Hatfield, 3 mi. N Noodle Creek field, 330 from N and E lines, 80-ac. tr. in M. Northington Sur. No. 270. S.S. gas 2,493 ft.; U.R. 6-in.

Mack Hayes and Montour Oil Co. No. 1 Chittenden. 7 mi. SE Hamlin. Subd. 18, McMullen & McGloin Sur. 337. Drlg. 2,800 ft.

Humble No. 1 I. N. Irwin, 330 ft. from S and W lines sec. 48-18, T.&P. Sur., 1½ mi. E Noodle Creek pool. Rotary to 3,200 ft. Spd.

Thos. D. Humphrey No. 2 N. D. Newton, 330 ft. from W line, 990 ft. from S line, Jas. Halfpenny Sur. 139. Rigged.

Iron Mountain No. 1 D. J. Herbst, 5 mi. E Hamlin, 330 ft. from N and E Sub. 18, Austin Williams Sur. 339. Set 10-in 2,245 ft.; drlg. 2,315 ft.

F. M. Loop No. 1 W. T. Young, 330 ft. from N line, 253 ft. from E. L. Young 276-ac., D. Bustillos Sur. 189. Loc.

F. W. Martin No. 1 B. N. Herndon, 330 ft. from S and W of NW sec. 1, M.E.&P. Sur. U.R. 8-in. to 2,135 ft.; H.F.W. in sd.

F. W. Merrick et al No. 1 C. A. Cox, cent. Cox 119-ac. tr., J. H. Hughes Sur. No. 201. Drlg. 1,195 ft.

Owens-Snebold No. 1 Alice Rhodes, 4 mi. W of Nugent, 330 ft. from N and W lines of NW¼ sec. 31, T.&P. Sur., Blk. 15. Lost hole 950 ft.; skd. 20 ft. E; U.R. S.S.O. 1,980-90 ft.; R.B.S.O. 2,227-45 ft.; H.F.W. 3,235 ft.; ran 6-in.; drlg. 3,700 ft.

B. H. Roth No. 1 D. A. Kinney, 4,000-ft. test, 330 ft. from S and E of NW sec. 7-4, H.&T.C. Sur. Running 8-in. to 2,140 ft.

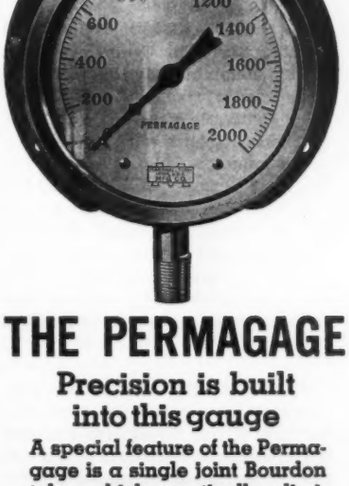
Stanton & Miller No. 1 Gaither, 4½ mi. N of Anson, sec. 38, B.B.B.&C. Sur. S.D. 2,180 ft.

Joe A. Worsham et al No. 1 J. H. Commons, 330 ft. from E line, S½ E 80-ac., Subdiv. 8, A. W. Hill Sur. No. 4. Loc.

Nolan County

Hantho-Nelson, Inc., No. 1 J. H. Withers, C SW¼ sec. 65-21, T.&P. Sur. Wildcat to drill 4,000 ft. Spd.

(Continued on Page 154)



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MARSHALLTOWN, IOWA

PERSONAL

DR. HARVEY N. DAVIS, president of the American Society of Mechanical Engineers and president of Stevens Institute of Technology, addressed the Engineers Club of Tulsa last week. While in Tulsa he was guest of honor at a reception given by HAROLD B. BERNARD of the Sinclair Prairie Oil Company, who for years has been prominently identified with engineering activities in the oil industry. Mr. Bernard is one of four Stevens graduates in Oklahoma.

LOUIS JOHNSON, acting secretary of war, has announced that the War Department will advocate no further legislation looking to exploration for oil in Barksdale field, Shreveport, La., adjacent to the Sligo oil and gas field.

C. L. SUHR, chairman of the board of the Pennzoil Company, Oil City, Pa., is spending a vacation at his ranch in Arizona.

E. O. BUCK, consulting engineer and geologist of Houston, Tex., is recovering in St. Joseph's Hospital, that city, from serious illness.

M. T. HARTWELL, Fort Worth, in charge of the Texas Company's West Central Texas geological division, has resigned to become district geologist for the Mid-Continent Petroleum Corporation at Abilene.

ERIC K. CRAIG, formerly geologist for the Shell Oil Company in the Rocky Mountain region, resigned and has opened a private office in Bakersfield, Calif. He expects to do some geological research work in Wyoming next summer.

S. C. SMITH, chief chemist for the Paluxy Asphalt Company of Talco, Tex., addressed the Ark-La-Tex chapter of the Western Petroleum Refiners Association last week at the monthly technical session in Kilgore, Tex.

MAX A. SHERWOOD has been promoted to superintendent of the McPherson, Kans., headquarters of the Shell Petroleum Corporation. He formerly was Kansas division mechanical engineer in which position he is succeeded by R. B. MOSTRIP, his former assistant.

P. F. GWYNN was appointed chairman of the executive committee of the North Texas Oil and Gas Association at the March meeting of the association directors in Wichita Falls Monday of this week. Other committee chairmen named are: Legislative, C. J. TUCKER; finance and membership, W. C. DUNCAN; tax, insurance, and accounting, FRED SCHMANN; proration, N. H. MARTIN; refiners, ROY B. JONES.

WILLIAM A. SLATER, general manager of refining for the Gulf Oil Corporation, Pittsburgh, Pa., and T. J. SULLIVAN, general superintendent, Port Arthur, Tex., are making an inspection trip through the company's western refineries.

WINTHROP ROCKEFELLER, son of JOHN D. ROCKEFELLER, JR., is serving as executive vice chairman of the Greater New York Fund. He has spent much of his time since leaving school gaining practical training in the oil industry with various Standard Oil Company of New Jersey subsidiaries and affiliated companies. JOHN A. BROWN, president of the Socony-Vacuum Oil Company, was appointed chairman of the employes committee by Mr. Rockefeller.

WILLIAM B. BERWALD, of the Bureau of Mines station in Bartlesville, Okla., who was called to Bradford, Pa., by the illness of his father, P. M. BERWALD, a well-known oil producer, has returned home. Mr. Berwald's condition was reported improved.

JOSEPH S. HELM, of the Standard Oil Company of New Jersey, was elected president of the Asphalt Institute at a meeting of the board of directors in New York last week. B. L. BOYE, of the Socony-Vacuum Oil Company, Inc., retiring president, was made chairman of the executive committee. Other officers elected were JAMES A. BLOOD, Standard Oil Company of California, vice president; T. M. MARTIN, Lion Oil Refining Company, vice president; A. M. MAXWELL, Standard Oil Company of Ohio, vice president; HERBERT SPENCER, Standard Oil of New Jersey, treasurer; F. V. WIDGER, Texas Company, secretary. J. E. PENNYBACKER continues as managing director.

ROBERT BRIGGS, Fohs Oil Company geologist, has been transferred from the Rodessa, Tex., field to El Dorado, Ark.

C. K. GAMBLE, director of the Socony-Vacuum Oil Company, recently left Los Angeles harbor for a combined business and pleasure trip to Australia and New Zealand.

MORRIS GOODIN, assistant to J. P. MARONEY, Rocky Mountain scout for Sinclair-Wyoming Oil Company in Casper, Wyo., is in California on vacation.

GEORGE PIRTLE, geologist of Tyler, Tex., and regarded as an authority on the East Texas field, declares it is his belief that the field will produce at its present rate 8 to 10 years longer, and that wells will flow 3 to 7 years.

CHARLES D. WELLS, Kansas district scout for the Carter Oil Company, was elected president of the newly organized Kansas chapter of the National Oil Scouts Association. W. W. SIMPSON, of the Skelly Oil Company, was elected vice president.

RAY G. COCANOWER, former manager of the Waggoner Refining Company in Electra, Tex., has resigned to become sales engineer with Universal Oil Products Company, Chicago. Previous to his service with Waggoner, Mr. Cocanower was manager of the Olney Oil & Refining Company plant in Olney, Tex., from 1929 to 1935.

W. S. ZEHRUNG, president of the Pennzoil Company, Oil City, Pa.; L. D. FULTON and D. J. HARVEY, plant superintendents; M. A. BREWSTER, treasurer; D. J. CAVANAUGH, a retired officer of the company, and JOHN O'DONNELL, editor of the Oil City Derrick, spoke at the annual banquet of Pennzoil employes in Oil City last week.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

A new epoch in laying pipe line is a feature of the construction of the General Pipe Line Company's line from Midway to San Pedro, Calif. A pipe screwing machine invented by J. J. and P. H. Mahoney, of San Francisco, was used, saving much labor and time. It does twice as much work with half as many men.

Jeremiah S. Heffernan, superintendent of the Burma Oil Company's pipe line system in Upper Burma, India, died on March 10 of pneumonia, in that country. He was a native of Oil City, Pa.

The Texas Company makes its first oil run from the Cushing field, on March 17.

20 YEARS AGO

A 17,000-barrel well, Gypsy Oil Company No. 13 Shumway, in Butler County, Kansas, and a 7,000-barrel well, Barnsdall Oil Company No. 1 in section 14-25-11, Osage County, Oklahoma, are the sensations of the week in the oil industry.

The Youngstown pool, Township 14-11, Okmulgee County, is a new "hot spot" in Oklahoma. It yields big wells.

Fisher & Gilliland, operating in the shallow Burkburnett, Texas, pool, drills below the shallow pay and gets a 500-barrel well at 1,610 feet.

10 YEARS AGO

A 3,000,000-foot gasser which has a showing of light oil, in eastern Lea County, New Mexico, has started a campaign of exploration there, led by Gypsy Oil Company in section 34-21-36. Several other widely scattered locations have been made.

A Dundee lime pool is opened in section 18, Greendale Township, Midland County, Michigan, by Pure Oil Company. The discovery well starts at 30 barrels per day.

For the first time in history crude oil will be pumped from the Atlantic seaboard westward by the National Transit Company. The first shipment will be to the Eclipse Works in Franklin, Pa., a few miles from the Drake well site.

PARAGRAPHS

H. EARL MARSH, Fort Worth, who opened the first Texas office for the Amerada Petroleum Corporation January 1, 1926, has been promoted from head of the land department for the Texas division to head of the land department for that company's Mid-Continent division with headquarters in Tulsa. He succeeds H. G. Officer, who died last year.

A. LEON DERBY and MISS VIRGINIA EWERS, both of Wichita, Kans., are to be married, it was announced last Saturday. News of the engagement links two names widely known in the oil industry. Mr. Derby is associated with his father, A. L. DERBY, chairman of the board of the Derby Oil Company. Miss Ewers is a daughter of HERMAN EWERS, president of the Ewers-Simpson Oil Corporation, Wichita, and a granddaughter of SAM FITZPATRICK, New York, vice chairman of the board of the Consolidated Oil Corporation. The wedding date was not named.

CHARLES ROWAN, vice president of the Rowan Drilling Company, Houston, Tex., has been in Cuba on a vacation trip.

J. L. MARTIN, secretary-treasurer of the Venmex Oil Company of Texas, is in New York for a few days. He plans to return to Wichita Falls, Tex., early in April.

M. E. LOMBARDI, San Francisco, vice president of the Pacific Public Service Company and a director of the Standard Oil Company of California, is in Los Angeles on business.

A. T. McDANNALD, of Smith & McDannald, drilling contractors, Houston, Tex., has returned from a combination business and pleasure trip to his recently acquired ranch in New Mexico.

R. P. PHILLIPS has joined the Bennett Oil & Gas Company, Houston, Tex., as field superintendent and will look after operations in the Dickinson field. Mr. Phillips was formerly in the production department of the Stanolind Oil & Gas Company in the Hastings field.

R. W. STULL, administrative assistant in the petroleum conservation division of the Department of the Interior, after an inspection trip to Kilgore, Tex., last week, recommended that federal tender board officers remain in Kilgore and be provided with better quarters.

AKURA OGURA, son of FUSAZO OGURA, president of the Ogura Oil Company, Tokio, Japan, and mechanical engineer of the company's refineries and plants, accompanied by SENSUKE MORIYA, chemical engineer for the Ogura interests, arrived in Los Angeles from Japan this week, on their way to Philadelphia, Pa., for a two months' study of American refineries and pipe line practices.

WILLIAM DEWEY LOUCKS, chairman of the board of the Barnsdall Oil Company, heads a group of Barnsdall executives who were to meet in New Orleans, La., Wednesday of this week for a tour of coastal properties. Leaving New Orleans Thursday night, after conference and discussion, the party was to go to Houston, Tex., devoting part of Friday to inspection of a well in Galveston Bay, 1½ miles offshore. Saturday morning the party is to leave by automobile for Corpus Christi, visiting the Placedo, McFaddin and Greta properties on the way. Sunday will be devoted to looking over the Flour Bluff and Saxet fields and the Barnsdall Refining Corporation plant in Corpus Christi. Monday the party will leave for San Antonio and Austin, arriving in Tulsa Tuesday morning for a directors' meeting. The personnel, besides Mr. Loucks, includes E. B. REESER, president; R. A. BROOMFIELD,, executive vice president; JAMES A. DUNN, vice president and secretary; D. L. FRAWLEY, vice president; D. R. SNOW, vice president and manager; L. D. MESSNER, vice president and treasurer; E. A. MARKLEY, chief geologist; C. D. MILLER, superintendent of production; GEORGE A. SCHWAB, superintendent land department; J. S. NOLAND, superintendent proration; R. E. SLEPPY, superintendent pipe lines and crude purchases; G. H. HARRINGTON, chief geophysicist; J. D. HEDLEY and CARL RICHARDSON, both Gulf Coast geologists. WILLIAM DEWEY LOUCKS, JR., of the New York office, is accompanying the party.

More Room for Work

Ralph B. Roark, executive vice president of the Shell Petroleum Corporation in the Mid-Continent region, has more room to work in, for a few days ago they widened his territory to include the active North Texas area. His domain now takes in all of Kansas and Oklahoma, all of the Panhandle district of Northwest Texas, and North Central Texas.

RALPH B. ROARK

Mr. Roark entered Shell's geological department in 1917, a few months after graduating from the University of Oklahoma, where he had majored in geology. In 1920 he was transferred to the production department at Yale, Okla., where he had charge of geological, exploration, exploitation engineering, and production engineering work. Three years later he was moved to Tonkawa, Okla., with duties much the same, and in 1925 he was made chief engineer in Oklahoma and Kansas, with headquarters in Ponca City, Okla. Two other promotions followed soon. In 1927 Mr. Roark was advanced to general field superintendent, with his office in Tulsa, and a year later he was appointed production manager. Late in 1937 he became executive vice president.

Mr. Roark is a member of the American Petroleum Institute advisory committee on fundamental research on occurrence and recovery of petroleum; research advisory committee, Bradford district, of the Pennsylvania Oil Producers Association; American Association of Petroleum Geologists, and Mid-Continent Oil and Gas Association. He married Miss Bertha Ramsey, of Norman, Okla., whom he met at the university. They reside in Tulsa and have one daughter.

FRANK HOVELL, formerly of Smackover, Ark., is the new superintendent of the United Refining Company's plant in Russell, Kans.

GEORGE W. STRAKE and E. A. SHOWERS, independent producers of Houston, Tex., attended the international boat races last week at Havana, Cuba. The trip was made on Mr. Strake's yacht.

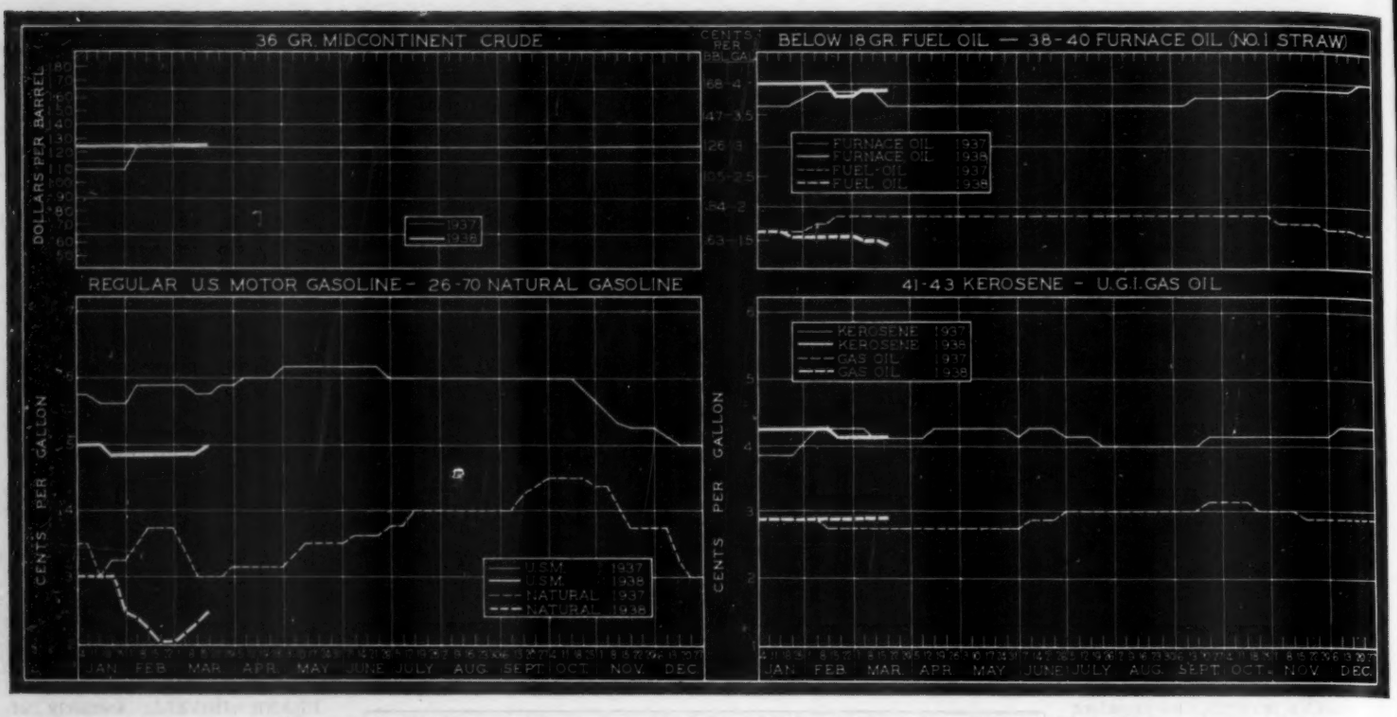
WILLIAM J. QUIGLES, manager of the Monroe division of the United Gas Pipe Line Company, has been transferred to the general offices in Houston, Tex., where he will serve as assistant production superintendent.

C. P. CHISHOLM, Houston, Tex., chief scout in the Gulf Coast division for the Pure Oil Company, has been promoted to assistant land man. He will continue as chief scout, with T. A. MILLER as his assistant.

R. S. KERR, T. M. KERR, R. H. LYNN, and D. A. McGEE, all of Oklahoma City, Okla., were among the interested spectators watching the testing of the Kerr-Lynn discovery well, east of Magnolia, Columbia County, Arkansas, on Sunday and Monday.

G. S. INNIS has been promoted to field superintendent for the Fohs Oil Company in the Jefferson area of the Rodessa field. His headquarters will be in Jefferson, Tex. R. G. DOBBS, formerly in charge of the company's Rodessa operations, has been transferred to Houma, La.

L. P. ST. CLAIR, W. D. MATTHEWS, W. W. ORCUTT, W. L. STEWART, JR., P. M. GREGG, A. B. MACBETH, GURNEY E. NEWLIN, STANLEY MORSEHEAD, DWIGHT WHITING, J. E. JARDINE, W. S. CHANLEY, and REESE H. TAYLOR, directors of the Union Oil Company of California, were reelected to the board at the annual meeting of the company in Los Angeles.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Group 3 Refiners Expect Brisk Buying to Precede Raise in Freight Rates

By T. F. SMILEY

Brisk buying of oil products before the increased freight rates go into effect March 28 is expected by refiners in the Group 3 area. With storage facilities of purchasers taxed in the effort to lay in as much material as possible under the old rates (roughly a saving of 10 per cent in transportation costs), a dull period immediately following the date of the increase is foreseen.

Further improvement in gasoline, increasing softness in the heating oils, another jump in the naturals, and gathering strength in the tractor distillates were developments of the week in the Group 3 market.

Tractor Fuel Demand Rising

It was the rising demand for tractor fuel, rather than more frequent use of the family car, that lifted low-octane motor fuel up a notch. Refiners who were glad to get 3¾ or even 3⅝ cents for this grade a few weeks ago were asking—and getting—4⅛ cents. A steadier tone characterized the whole list, notwithstanding total stocks which have reached unprecedented volume and which remain a problem on the hands of the marketing branch. Although there is no disposition in the trade to minimize the threat which mounting gasoline stocks constitute, there is less nervousness concerning them than there was a month ago. It is pointed out that in the Mid-Continent at least, no distress material is reported. The heavy inventories are in strong hands, and there is a growing belief that they will not be allowed to flood the market. In East Texas only four refineries were operating on federal-tender crude.

Heating oils from the No. 2 grade down to the bottom of the list were exhibiting more pronounced softness. Buyers were encountering less resistance to their efforts to get concessions.

With spring plowing beginning in many districts, a lively call for tractor fuel was reported. As favorable weather conditions open up further regions for this work refiners look for widening demand. Not only the specially prepared tractor fuels are benefiting from this business, but low-octane gasoline, 41-43 kerosene, range oil, and prime-white distillate as well, since all of these are readily convertible into tractor fuel. Range oil, as untreated kerosene is designated, is especially easy to make into tractor fuel by lowering its initial and flash.

Naturals at New High

Natural gasoline, which ended a precipitate slump in late February and began to climb back, reached new high ground for its current movement in the past week. The spread between Oklahoma and Texas material disappeared, a circumstance which probably indicates quotations will rest a while at their present levels. As prices have risen jobber demand for blending purposes has subsided, with the result that the output of Oklahoma manufacturers no longer finds an adequate outlet in northern markets, and surplus production now is being shipped to the Gulf, where it is going to refineries or to ocean terminals for export or coastwise trade.

Jobbers who had been buying 12- and 14-pound natural and blending it with a low-octane refinery product cannot afford to pay the higher prices now ruling for these grades, so they are turning to the higher vapor pressures, including the 26-pound. While this puts a brake on the market for stabilized grades, it increases that for the 26-70. The large manufacturers for weeks have been staying out of the spot market because prices did not cover the cost of manufacture.

Bright stocks and neutrals were steady at unchanged prices, with prospects of a still firmer market. Jobbers are storing for spring business. Some refiners reported an excellent movement. Wax was off. Heavy industrial fuels were dropping lower.

Refined Oil Market Barometer

Anxiety over record-breaking gasoline stocks is tempered by reports that relatively little surplus material is in the hands of small refiners. Belief is growing that strong interests owning most of the big inventories will not dump them. Buyers of refinery products are expected to stock up before March 28, when higher freight rates go into effect.

MID-CONTINENT. Gasoline improving. Heating oils easy. Tractor distillates strong.

EAST COAST. Gasoline picking up. Bright stocks, neutrals dull. Heating oils off.

GULF COAST. General market inactive. Gasoline weak. Kerosene off.

CALIFORNIA. Motor fuel off. Kerosene easier. Gas oil and diesels soft.

PENNSYLVANIA. Gasoline slightly stronger. Fuel oil demand falling off.

CHICAGO. Gasoline steadier. Kerosene and tractor fuels in better demand.

Eastern Gasoline Demand Up; Bunker C Fuel Oil Reduced

By H. STANLEY NORMAN

NEW YORK, Mar. 15.—Skidding of tanker rates into new low ground for the current movement reacted last week on Bunker C fuel which was reduced 10 cents per barrel at the New York terminal making the new posting $1.15 per barrel. Deflation of tanker rates continued throughout last week reaching a low mark of 18 to 19 cents per barrel for movement of crude from the Gulf Coast to North Atlantic ports if loaded promptly. Rates on clean boats are two to three cents per barrel higher, but in general drifted into lower ground under pressure of slack demand. A cargo of crude oil was lifted on the Gulf Coast on March 15 consigned to a New Jersey port with a rate of 18 cents per barrel applying to the trip.

While the dwindling tanker rate was largely responsible for the reduction in Bunker C fuel oil prices, there had been considerable shading reported during the past two weeks on the part of Gulf Coast suppliers. The combination of price concessions from suppliers and the declining tanker rate was too formidable to resist longer. Bunker grades of fuel oil have felt the influence of curtailed activity on the part of manufacturers and railroads more than other products.

Return of near freezing temperatures at end of the week imparted a temporary stimulant to the domestic heating oil movement, but the season is definitely limited and traders are turning their attention to motor fuel. Gasoline is reported fairly stable in New York where current spot business is mostly on a basis of 6½ to 6¾ cents per gallon for 65 octane motor fuel. Rumors are heard frequently that gasoline is moving in limited quantities at lower figures, but confirmation is either entirely lacking or confined to a few cars.

There is evidence in many directions that the motor fuel demand is picking up satisfactorily in this area despite temporary lulls such as caused last week by a slight snowfall Thursday and colder weather Friday. Some quarters report February gasoline business slightly improved over the same month in 1937 while others say volume suffered a slight decline. Those reporting a decline in February business are about balanced against those with larger gallonage to indicate that the second month this year was about on a par with the same period in 1937.

The extent to which buyers are preparing for the summer season is evidenced by the volume of traffic into the New York area. Over the week-end of March 5-6, a total of nine loaded tankers arrived in New York harbor for discharge at various points along the New York and New Jersey coast.

Pennsylvania bright stocks and neutrals continued dull during the entire week, although the markets were strictly nominal as applicable to inter-refinery trading. The quotations to jobbers, however, were unchanged in anticipation of more spirited demand for the summer change-over season. Several Pennsylvania refiners have worked off their demand back-log for lubricating oils which went to make up several export cargoes lifted during January and February. Stocks were backing up in some quarters.

Fuel oil demand in the western Pennsylvania district continued to taper off, partly due to seasonal conditions and partly because of the market inroads made by Ohio refiners who have experienced slackened consumption from automobile manufacturing centers. Kerosene has followed other light grades of fuel oil into a weaker market position. Several Pennsylvania refiners are cracking their entire naphtha cut without removing kerosene. Motor fuel of 65 octane rating was selling in the western Pennsylvania district to tankcar buyers at a range of 6½ to 7⅛ cents per gallon.

Light fuel oils in New York are unchanged from levels established early in March and late February. Domestic grades of heating oils ranging from No. 2 to No. 4 are currently quoted at 4¾ to 5 cents per gallon to the tankcar trade and tankwagon deliveries to contract customers throughout the metropolitan area, including Long Island, are being made at 7 cents per gallon. The tankwagon price prevailed at 7½ cents during most of the winter, but was lowered a half cent after the break in tankcar quotations. The break last week in Bunker C fuel oil prices followed a week or two in which the Gulf Coast market for the product was said to be on soft ground. Sales of Bunker C had been reported as low as 82½ cents per barrel on the Gulf.

Most other Gulf Coast markets were inactive or drifted into lower ground. Gas oil was reported involved in trading at 3⅞ cents per gallon, although this material with a favorable diesel index, ranging from 47 upward, was was generally held at quotations from one-eighth to one-quarter of a cent per gallon higher. A French buyer was reported to have closed on a cargo of about 60,000 bbls. of gas oil for April loading at 3⅞ cents.

Open market activity in motor fuel at the Gulf Coast was at a low mark, but coastwise and export movement against contracts held to reasonably stable ground. Buyers are still watching developments in the crude oil market confident that the summer upswing probably will not develop for at least 30 days.

Open gasoline market quotations most frequently heard to coastwise shippers ranged from 5 to 5¾ cents per gallon, depending on the octane rating specified. Export gasoline quotations range from 4⅞ to 5⅛ cents per gallon for 64-66, 375-end-point material.

A cargo of neutral oil consisting of about 8,500 bbls. of Mid-Continent stock was involved in a Gulf Coast order last week. The material was reported placed under hatch at 8¾ cents per gallon for the account of an export buyer. Trend of refined products prices during the next two or three weeks is expected by observers to be intimately linked with the tanker market. In this connection some are of the opinion that last week's closing rates on boats are about the bottom in keeping with current operating costs and that any change will be upward.

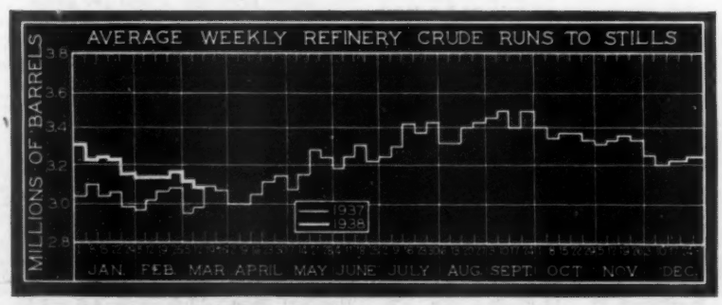
(Continued on Page 152)

A. P. I. Weekly Refinery Statistics

Week Ending March 12, 1938

	Capacity reporting (per cent)	Daily crude runs (bbls.)	Total gasoline stocks	Gas oil and fuel oil stocks
East Coast	100.0	488,000	22,276,000	9,300,000
Appalachian	88.4	90,000	3,670,000	1,250,000
Indiana, Illinois, and Kentucky	92.4	405,000	15,764,000	6,796,000
Oklahoma, Kansas, and Missouri	84.7	246,000	8,204,000	3,433,000
Inland Texas	56.6	148,000	2,830,000	1,631,000
Texas Gulf	95.7	713,000	14,134,000	9,421,000
Louisiana Gulf	96.6	132,000	2,363,000	3,063,000
North Louisiana and Arkansas	63.7	39,000	495,000	506,000
Rocky Mountains	69.7	46,000	2,338,000	771,000
California	90.9	514,000	16,050,000	84,107,000
Total reported	89.0	2,821,000	88,124,000	120,278,000
Estimated unreported	.....	279,000	4,960,000	2,540,000
*Estimated total	.....	3,100,000	93,084,000	122,818,000
*Estimated total, previous week	.....	3,130,000	92,151,000	122,471,000
*March 13, 1937	.....	2,985,000	81,236,000	98,964,000

*Bureau of Mines, currently estimated.



Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATES)

Week ending February 26, 1938	305,167,000 barrels
Week ending February 19, 1938	305,219,000 barrels
Week ending February 27, 1937	289,082,000 barrels

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of March 15, 1938

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county and city taxes. The gasoline is the regular or standard grade. In most areas a third grade and a premium grade are also available.

Standard Oil Co. (Indiana)

	Gasoline			Kero.
	Tank wag.	Dlr.	Inc. tax	tank-wag.
Chicago, Ill.	15.3	13.3	4.0	10.2
Decatur	15.3	13.1	4.0	10.2
Joliet	15.3	13.8	4.0	10.2
Peoria	15.3	13.8	4.0	10.2
Quincy	15.1	13.6	4.0	10.0
Davenport, Ia.	15.3	13.8	4.0	‡13.2
Des Moines	15.1	13.6	4.0	‡11.0
Mason City	15.4	13.9	4.0	‡13.3
Sioux City	15.3	13.8	4.0	‡13.2
Duluth, Minn.	17.0	15.5	5.0	10.9
Mankato	16.7	15.2	5.0	10.6
Minneapolis	16.7	15.2	5.0	10.6
Lacrosse, Wis.	16.7	15.2	5.0	10.6
Green Bay	17.0	15.5	5.0	9 9
Milwaukee	16.5	15.0	5.0	10 4
Detroit, Mich.	15.1	13.6	4.0	9 8
Grand Rapids	16.3	13.1	4.0	11.0
Saginaw	16.1	14.6	4.0	9.1
Evansville, Ind.	16.8	15.3	5.0	†10.7
Indianapolis	16 9	15.4	5.0	†10 8
South Bend	17.2	15.7	5.0	9.0
Fargo, N. Dak.	16.7	15.2	4.0	11 6
Minot	17.9	16.4	4.0	12.8
Huron, S. Dak.	17.1	15.6	5.0	11 0
Kans. City, Mo.*	14 6	13 1	4.0	9 5
St. Louis*	14.9	13.4	4.0	9.8
St. Joseph	14.6	13.1	4.0	9 5
Wichita, Kans.*	14.1	11.0	4.0	7.0

*State tax 2 cents, 1-cent city tax and 1-cent federal tax. †Does not include 4-cent state tax. ‡Iowa kerosene prices include 3-cent state tax.

(Exclusive of state general sales taxes, except Indiana and South Dakota.)

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gallons or more, 1.5 cents off; minimum delivery 25 gallons.

Stanolex Fuel Oil in Chicago

Effective Dec. 7, 1936, f.o.b. Chicago tank-wagon prices: Range oil, 1-99 gallons, 8.8 cents; 100-149 gallons, 7.8 cents; 150 gallons and over, 7.3 cents. Stanolex No. 1, 1-99 gallons, 8.8 cents; 100-149 gallons, 7.8 cents; 150 gallons and over, 7 cents. Stanolex furnace oil, 1-149 gallons, 7.8 cents; 150 gallons and over 7 cents; Stanolex A, 1-399 gallons, 5.75 cents; 400 gallons and over, 4.75 cents. Stanolex B, 1-799 gallons, 5.75 cents; 800 gallons and over, 4.75 cents.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline			Kero.
	Tank-wag. dlr.	Tank-car con'r.	Inc. tax	tank-wag.
Atl'tic, City, N. J.	12.75	11.25	4.0	8 5
Newark	12.75	11.25	4.0	8 5
Annapolis, Md.	14.85	13.35	5.0	9 5
Baltimore	14.25	12.75	5.0	9 0
Cumberland	16 65	14.15	5 0	10 0
Wash'g'n, D. C.	12 5	11 0	3 0	9 5
Danville, Va.	16.95	14.45	6 0	12.9
Norfolk	15.75	13.25	6.0	11.5
Petersburg	16 05	13 55	6.0	11.7
Richmond	16.05	13.55	6.0	11.7
Roanoke	17.25	14.75	6.0	12.9
Charles'n, W. V.	17 05	14 55	6 0	12 6
Parkersburg	15 35	13 85	6 0	11 2
Wheeling	16 25	14 85	6 0	12 2
Charlotte, N. C.	18 65	16 15	7 0	12 6
Hickory	19 15	16 65	7 0	13 0
Mt. Airy	18 95	16 45	7 0	12 8
Raleigh	18 25	15 75	7 0	12 1
Salisbury	18 75	16 25	7 0	12 7
Charleston, S. C.	17 25	14 75	7 0	11 1
Columbia	18 25	15 75	7 0	12 1
Spartanburg	18 95	16.45	7.0	12 9

Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gallons, consumer tank-wagon price at time and place of delivery; 100,000 gallons per year, consumer tankcar price plus .5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less .5 cent per gallon.

Effective May 15, 1937, in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax counties): Commercial consumers taking deliveries of 50 gallons (W. Va., 100 gallons) or more at one time will be billed at posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons (W. Va., 100 gallons) will be billed at 4 cents per gallon over posted consumer tank-wagon price. Generally the posted consumer tank-wagon price will be the equivalent to the dealer price less .5 cent per gallon.

Discount for kerosene, 1 cent off tank-wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except no discount in New Jersey.

Southern District

STANDARD OIL CO. OF KENTUCKY

	Gasoline			Kero.
	Tank-wag.	Net dlr.	Inc. tax	tank-wag.
Atlanta, Ga.	21.0	18 0	7.0*	†14 0
Augusta	21.0	18 0	7.0	*14 0
Macon	21.0	18.0	7.0	*14 0
Savannah	19 5	16 5	7 0	*12 0
Birm'ham, Ala.	21 0	18 0	8 0	12.0
Mobile	19 0	16.0	9 0	†11 0
Montgomery	22 0	19 0	9 0	†13 0
Jackson, Miss.	19.5	16.5	7 0	*13.0
Vicksburg	19.5	16.5	7 0	*13 0
Jacks'ville, Fla.	22 5	17 5	8 0	†11 0
Miami	20 5	17 5	8 0	†12 5
Pensacola	22 0	19 0	9 0	12 0
Tampa	20 5	17 5	8 0	10 5
Lexington, Ky.	19.0	16 0	6.0	11.0
Covington	18 5	15 5	6 0	11 0
Louisville	19 0	16 0	6 0	10 5
Paducah	19.5	16 5	6 0	10 0

Price basis to tank-wagon consumers: Effective January 4, 1937, 3 cents per gallon below tank-wagon price. Kerosene prices in all states subject to 2 cents discount except in Kentucky where prices are net.

*Includes 1-cent state tax. †Subject to 2-cent discount.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax; and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola has a city gasoline tax of 1 cent.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline			Kero.
	Dealer		Inc. tax	tank-wag.
Denver, Colo.	14 0		5 0	11 5
Grand Junction	19 0		5 0	15 0
Pueblo	13.0		5.0	10.5
Casper, Wyo.	17.0		5 0	11 5
Cheyenne	16 0		5 0	13 0
Butte, Mont.	19 5		6 0	15.5
Billings	19 5		6 0	15.5
Helena	19 5		6 0	15.5
Great Falls	19 5		6 0	15 5
Salt Lake City, Utah	19 5		5 0	16 0
Twin Falls, Ida.	21 0		6 0	18 0
Boise	21.5		6 0	18 0
Albuquerque, N. M.	17.5		*6.5	12 0

*Includes city tax of one-half cent.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline			Kero.
	Tank-wag.	Di-vided con'r.	Inc. dlr.	tank-tax wag.
Ohio points	16.0	15.00	5.0	*13.0

*Includes state tax of 1 cent.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline			Kero.
	Tank-wag. dlr.	Tank-car con'r.	Inc. tax	tank-wag.
Albany, N. Y.	14.5	12.5	5.0	9 0
*Met. N. Y.:				
M'nh't'n, Br'nx	14 5	12 5	5 0	8 75
Staten Island	14 5	12.5	5 0	8 75
Q'ns. & Brklyn	14 5	12 5	5 0	8 75
Buffalo	14.5	13.54	5.0	7.5
Rochester	15 0	13 17	5 0	8 5
Syracuse	14 5	13 12	5 0	9 0
Boston, Mass.	13 0	11.5	4 0	8 5
Portland, Me.	14 5	12 7	5 0	8 75
Manch'ter, N.H.	15 0	13 0	5 0	9 0
Burlington, Vt.	14.9	12 9	5 0	9 5

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes.

Price basis to undivided dealer: Posted dealer tank-wagon price less .5 cent. Price basis to commercial consumer. Effective Nov. 15, 1936, monthly purchases of 25,000 gallons and over, consumer tankcar prices at delivery point plus .5 cent per gallon; monthly purchases of 5,000 to 25,000 gallons, undivided dealer price at delivery point; monthly purchases under 5,000 gallons, pay divided dealer tank-wagon prices at delivery point.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline			Kero.
	Tank-wag.	Serv. sta.	Inc. tax	tank-wag.
San Francisco	17 5	18 5	4 0	11 5
Los Angeles	17 0	18 0	4 0	10 0
Fresno, Calif.	18 5	19 5	4 0	12 5
Phoenix, Ariz.	21 0	22 0	6 0	*17 0
Reno, Nev.	20 0	21 0	5 0	13 0
Portland, Ore.	20 0	21 0	6 0	13 5
Seattle, Wash.	20 0	21.0	6 0	13 5
Spokane	22 5	23 5	6 0	16 0
Tacoma	20 0	21.0	6.0	13 5

*Includes 5-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents; to split dealers, 2 cents. To commercial consumers: on tank-wagon price: on single deliveries of 40 gallons and over, advance quantity discount extended at time of delivery, 3 cents. Service station schedule applies on single deliveries less than 40 gallons. On kerosene in tankcar, transport truck and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank-wagon.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline			Kero.
	Tank wag.	Drl.	Inc. tax	tank-wag.
Omaha	17 7	16 2	6 0	10 5
McCook	17.5	15 0	6 0	10.0
Norfolk	18 1	16 6	6.0	10 0
North Platte	18 5	17 0	6 0	11 3
Scotts Bluff	19 2	16 0	6 0	12 0

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective Jan. 1, 1935.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline			Kero.
	Tank-wag. dlr.	Tank-car con'r.	Inc. tax	tank-wag.
N. Orleans, La.	19 0	16 5	*10 0	†12 0
Baton Rouge	17.0	14 5	8 0	12 0
Alexandria	17.5	15.0	8.0	10.5
Lafayette	18.0	15.5	8.0	12.5
Lake Charles	18.0	15.5	8.0	12.5
Shreveport	16.5	14.0	8.0	9.5
Kn'ville, Tenn.	20.0	17.5	8.0	14.0
Memphis	18.0	15.5	8.0	12.0
Chattanooga	19.5	17.0	8.0	13.5
Nashville	19.0	16.5	8.0	11.5
Bristol	19.0	17.75	8.0	14.5

*Includes 2-cent parish tax. †Includes 1-cent parish tax and 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gallons or more in one delivery takes posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less .5 cent per gallon. Louisiana kerosene prices include 1-cent state tax.

Pennsylvania, Delaware and Part of New England

ATLANTIC REFINING CO.

	Gasoline			Kero.
	Tank-wag. dlr.	Tank-car con'r.	Inc. tax	tank-wag.
Philadelphia, Pa.	13 75	12 25	5 0	10 5
Pittsburgh	15 0	13 0	5 0	11 0
Allentown	14 25	12 75	5 0	11 0
Erie	14 5	13 0	5 0	10.0
Scranton	14 5	13 0	5 0	11.0
Altoona	15 0	13 0	5 0	11 0
Dover, Del.	14.0	....	5.0	11.0
Wilmington	14 0	....	5 0	11 0
Springf'd, Mass.	13 5	....	4 0	8 5
Worcester	14 3	....	4 0	9 0
Hartford, Conn.	13 6	....	4.0	8 0
New Haven	13 5	....	4 0	8 0
Providence, R. I.	13.3	....	4 0	8 5

Price basis to undivided dealers, dealer tank-wagon price less .5 cent per gallon. Price basis to commercial consumers in Pennsylvania and Delaware, effective March 11, 1937: Consumers under contract using 100,000 gallons or more per year full compartment hose deliveries, tankcar plus .5 cent. Consumers under contract using less than 100,000 gallons per year compartment hose deliveries, undivided dealer price. Consumers under contract less than full compartment delivery, consumers not under contract less than full compartment delivery, and consumers not under contract full compartment delivery, divided dealer price. Less than 25 gallons, tank-wagon delivery, 4 cents per gallon above undivided dealer price.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline		Kero.
	Dealer	Inc. tax	tank-wag.
Muskogee, Okla.	14 5	5 0	7.0
Oklahoma City	14 0	5 0	8.0
Tulsa	14.0	5.0	6.0
Ft. Smith, Ark.	14.25	5.0	8.0
Little Rock	17.25	7.5	9.5
Texarkana	14.0	5 0	8.5

Texas

	Gasoline			Kero.
	Tank-wag.	Serv. sta.	Inc. tax	tank-wag.
Dallas, Tex.	14.0	18.0	5.0	8.0
Fort Worth	14 0	18 0	5.0	8.0
Houston	14 5	19 0	5 0	8.0
San Antonio	13 5	17.5	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank-wagon*
Oleum spirits	15 7
V.M.&P. naphtha	16 0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax, but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gallon lots if covered by contract.

Canada*

3 Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Tank-wag.	Inc. tax	Kero. tank-wax.
Halifax, N. S.	24.0	8.0	18.5
St. John, N. B.	24 0	8.0	18.5
Montreal, Que.	21.0	6.0	17.5
Toronto, Ont.	22.0	6.0	17.0
Hamilton, Ont.	22.0	6 0	17.0
Winnipeg, Man.	27 5	7 0	20.7
Brandon, Man.	28.1	7.0	22.3
Regina, Sask.	27 0	7.0	22.0
Saskatoon, Sask.	29 8	7 0	24.9
Edmonton, Alta.	26 5	7 0	21.5
Calgary, Alta.	24 0	7 0	19.0
Vancouver, B. C.	23.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon price. Discount to undivided dealers, 1 cent below tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Retail Price Changes

Continental Oil Co. March 10 reduced dealer gasoline 1 cent at Denver.

Standard Oil Co. of Nebraska March 7 reduced tank-wagon kerosene .9 cent at Norfolk.

Atlantic Refining Co. March 3 advanced tankcar consumer and dealer gasoline .5 cent at Philadelphia; February 28 reduced tank-wagon kerosene .5 cent at Hartford.

New York Market

(Continued from Page 151)

Tanker brokers declare that tonnage available for spot chartering is no greater or perhaps less than prevailing at similar seasons in the past and that for this reason the market is in position to move upward with any improvement in demand.

Southern Alberta

In the Taber field, southern Alberta, Plains Petroleum Corp. No. 3, section 25-9-17w4, got the Madison limestone at 3,285 feet with an encouraging crude show at the contact. Deepening in the lime brought a water encroachment. It is deepening below 3,400 feet after recementing. Plains Petroleums No. 2, LSD 11, same section, is rated good for 120 bbls. a day potential, of 27-gravity crude, and has about 1,500 bbls. in storage. The crude will be marketed to Regina. Results in Plains No. 3 indicate that new development will likely be to the northeast of the present field.

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of March 15, 1938

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 oct. and below		.04⅛
63-66 octane	.04⅜	.04½
67-69 octane	.04⅝	.04⅞
70-72 octane (regular)	.05	.05⅛
60-62 400 grades:		
62 oct. and below		.04¼
63-66 octane	.04⅜	.04½
67-69 octane	.04⅝	.04⅞
70-72 octane (regular)	.05	.05⅛
64-66 375	.04¼	.04⅜
68-70 360	.04⅞	.05⅛

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.04⅛	.04¼
63-66 octane	.04⅜	.04⅝
67-69 octane	.04⅝	.04⅞
70-72 octane (regular)	.05	.05⅛
60-62 400		.04
64-66 375	.04½	.04¾

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)

U. S. Motor grades:		
62 octane and below	.04¼	.04½
63-66 octane	.04½	.04⅝
67-69 octane	.04⅞	.05
70-72 octane (regular)		.05½

ARKANSAS (Ark., N. La., Miss. del.)—

U. S. Motor grades:		
62 octane and below	.04¼	.04½
67-69 octane	.04⅞	.05
70-72 octane (regular)	.05½	.05⅝

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.04⅛	.04¼
63-66 octane	.04⅜	.04⅝
67-69 octane	.04⅝	.04⅞
70-72 octane (regular)	.05	.05¼
60-62 400 grades:		
62 octane and below	.04¼	.04½
63-66 octane	.04⅜	.04⅝
67-69 octane	.04⅝	.04⅞
70-72 octane (regular)	.05	.05¼
64-66 375	.04¾	.05
68-70 360	.05	.05¼

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor:		
Below 60 octane	.04⅝	.05
65 octane	.06	.06½
68-70 octane	.06½	.07

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.06¾	.08¼
58-60 400, 65 oct. and higher	.08½	.09¼

EAST COAST (Domestic)—

U. S. Motor, 60-64.9 octane:		
New York (Bayonne)		.06½
Philadelphia	.06½	.06¾
Boston	.06½	.06¾
Baltimore	.06½	.06¾
Charleston, S. C.	.07	.07¼
U. S. Motor, 65 and above:		
*New York (Bayonne)	.06¾	.07
Philadelphia	.06¾	.07
Boston	.06¾	.07
Baltimore	.07	.07¼
Charleston, S. C.	.07¼	.07½

*All grades of gasoline one-eighth to one-fourth cent less for barge shipments. New York harbor prices are for New York and New England delivery. Prices for New Jersey delivery one-fourth cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane	.05	.05¼
60-64.9	.05¼	.05⅝
65 octane and higher	.05½	.05¾

Naphtha

PENNSYLVANIA (inland refineries)—

52-56 450 (blending)	.04½	.04¾

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02½
Grade 18-55		.03

NORTH TEXAS—

Grade 26-70		.02½
Grade 18-55		.03

CALIFORNIA—

75-85 375-390	.06½	.07

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

Grade 26-70		.02⅞

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110 flash, 540-550 e.p.	.04⅛	.04¼
41-43 gr., 300-520 e.p., 110-125 flash, 500-520 e.p.	.04¼	.04⅜
46-48 gr., 210-230 l.b.p., 480 max. e.p.	.04⅝	.04¾

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.04⅛	.04¼
42-44	.04¼	.04⅜

NORTH TEXAS—

41-43	.04⅛	.04¼

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

41-43	.04⅜	.04½

ARKANSAS (Ark., N. La., Miss. del.)—

41-43	.04½	.04⅝

PENNSYLVANIA (inland refineries)—

45	.05¼	.05⅜
46	.05⅜	.05½
47	.05½	.05⅝

CHICAGO (Based on Group 3)—

41-43	.04⅛	.04⅜
42-44	.04⅜	.04⅝

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.05¼	.06½

NEW YORK (Bayonne, N. J.)—

41-43		.05¾

***GULF COAST (domestic)—**

41-43	.04⅞	.05

*Barge price one-eighth cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

No. 1 prime white, 38-42		.04
No. 1 straw, 38-40		.03⅞
No. 2 straw, 32-36	.03⅝	.03¾
No. 2 dark, 32-36	.03½	.03⅝
No. 3 zero to 15, 28-32	.03⅜	.03⅝
No. 3, 15 and above, 28-32	.03	.03⅛

NORTH TEXAS—

No. 1 prime white, 38-42		.04
No. 1 straw, 38-40		.03⅞

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

No. 2, 32-36		.03⅝

ARKANSAS (Ark., N. La., Miss. del.)—

No. 2, 32-36	.03¾	.04

CHICAGO (Based on Group 3)—

No. 1 prime white, 38-40	.04	.04¼
No. 1 straw, 38-40	.03⅞	.04
No. 2 straw, 32-36	.03¾	.03⅞
No. 2 dark, 32-36	.03½	.03¾
No. 3, zero to 15, 28-32	.03½	.03⅝
No. 3, 15 and above, 28-32	.03	.03⅛

NEW YORK (Bayonne, N. J.)—

*No. 1		.05¾
*No. 2		.04¾
*No. 4		.04¾

*Barge deliveries one-eighth to one-fourth cent under above tankcar price.

Gas Oil and Fuel Oil

(Gas oil per gal.; fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02⅞	.03
No. 4, low cold test, 24-28	1.10	1.15
No. 4, 15 and above, 24-28	.90	.95
No. 5, low cold test, 18-22	.72½	.77½
Below 18 fuel oil, industrial	.60	.65

NORTH TEXAS—

U.G.I. gas oil	.02⅞	.03
No. 4, low cold test, 24-28	1.10	1.15
No. 5, low cold test, 18-22	.80	.85
Below 18 fuel oil, industrial	.60	.65

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

10-14 fuel oil, industrial	.80	.85

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02⅞	.03⅛
No. 4, low cold test, 24-28	1.10	1.15
No. 4, 15 and above, 24-28	.90	.95
No. 5, low cold test, 18-22	.72½	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low cold test, 10-16	.60	.70
No. 6, 15 and above, 10-16	.42½	.55

PENNSYLVANIA (inland refineries)—

36-40	.04⅝	.04¾

CALIFORNIA

Los Angeles:		
30-40 gas oil, per bbl.	1.35	1.60
24 plus diesel, per bbl.	1.45	1.60
24 plus diesel (bunkers)	1.50	1.65
12-16 (bunkers at tidewater)	.90	1.00
10-16 (cargo lots)	.85	1.00
12-17 (tankcars)	.80	1.00
10-17 (high sulfur)	.65	.90
San Joaquin Valley:		
10-18 (tankcars)	.60	.85
24 plus diesel, per bbl.	1.45	1.60
San Francisco:		
24 plus diesel, per bbl.	1.50	1.60
24 plus diesel (bunkers)	1.60	1.65
10-16 (bunkers)	1.00	1.05

GULF COAST—

28-30 gas oil	.04⅛	.04¼
28-30 diesel (bunkers)		1.90
Bunkers (bulk cargoes)		.85
Bunker C (bunkers)	.90	1.05

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04¾
28-30 diesel (lighterage 6¼c per bbl.)		1.95
28-30 diesel (tankcars)	.04¾	.05
Bunker C (to ocean-going ships in N. Y. harbor)		1.15
Industrial fuel (tankcars)	.04	.04¼

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

Bright Stocks:		
190-200 D, 15-25		.19
150-160 D, 0-10		.16
150-160 D, 15-25		.15
150-160 E, 15-25		.14½
100-110 D, 0-10		.14½
Steam refined:		
631 green (treated)		.13½
600 dark green (untreated)		.05

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour test	.18½	.19½
15 pour test	.17½	.18½
20 pour test	.16½	.17½
25 pour test	.15½	.16½
Steam refined:		
600	.08½	.09
650	.10½	.11½
600 Pennsylvania flash	.11	.13
630 flash	.14	.15
600 Warren E filtered	.13	.14

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

Zero to 10 Cold Test:	
150-3	.09
180-3	.10
180-4	.09½
200-3	.10½
200-4	.10
250-3	.11½
250-4	.11
280-3	.12½
280-4	.12
300-3½	.13
400-3½	.14
100-2½ paraffin oil	.06
15-20 Cold Test:	
200-3	.10
200-4	.09½
250-3	.11
250-4	.10½
280-3	.12
280-4	.11½

GULF COAST—

Pale Oils:		
200-3	.07	.07¼
300-3	.07½	.07¾
500-3½	.08½	.08¾
750-3½	.08⅝	.09¼
1,200-3½	.09½	.09¾
1,500-4	.09¾	.10
Red Oils:		
200-5-6	.07¼	.07½
300-5-6	.07¼	.07½
500-5-6	.08	.08½
750	.08¾	.09
1,200-5-6	.09¼	.09½

CALIFORNIA (moving to dom. market)—

Pale Oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red Oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¾	.11½

PENNSYLVANIA—

150 vis. at 70° F. color, 400-405 flash:		
Zero pour test	.17½	.18
10 pour test	.16½	.17
15 pour test	.16	.16½
25 pour test	.15	.15½
180 vis. at 70° F., 3 color:		
25 pour test	.16	.16½
200 vis. at 70° F., 3 color:		
Zero pour test	.20½	.21
10 pour test	.19½	.20
15 pour test	.19	.19½
25 pour test	.17	.17½

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale	.02¼	.02½

PENNSYLVANIA (inland refineries)—

122-124 (a.m.p.) w.c. scale	.0200	.0210
124-126 (a.m.p.) w.c. scale	.0200	.0210

NEW YORK—

Wax in bags fully refined:		
122-125 (a.m.p.) wax		.0420
125-127 (a.m.p.) wax		.0435
128-130 (a.m.p.) wax		.0445
130-132 (a.m.p.) wax		.0455
133-135 (a.m.p.) wax		.0500
135-137 (a.m.p.) wax		.0515
124-126 (a.m.p.) w.s.	.0205	.0215
124-126 (a.m.p.) y.s.	.0200	.0210
Petrolatum in barrels, carload lots:		
Dark green	.02	.02⅛
Amber	.02⅜	.02½
Extra amber	.02⅝	.02¾
Lily white	.05½	.05¼
Snow white	.06⅛	.06¼
Cream	.04⅛	.04¼

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.04⅞	.05
60-62 400	.04⅞	.05
61-63 390	.05	.05½
64-66 375	.05	.05⅛

LOS ANGELES—

U. S. Motor grades:		
55-65 octane	.05¼	.05½
65-69 octane		.05¾
Above 69 octane		.06¼

KEROSENE

GULF COAST—

41-43 prime white	.04⅝	.04¾
41-43 water white	.04¾	.04⅞
44 water white	.04⅞	.05

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.o.s. in bbls.)—

Cylinder Stocks:		
600 Warren E	.20½	.21
600 S.R. unfiltered	.16	.16½
630 S.R. unfiltered	.18	.18½
600 flash S.R.	.18½	.19
630 flash, S.R.	.21½	.22
Bright Stocks:		
8 color	.23	.23½
6½ plus color in dilution	.22½	.23

NEUTRAL OIL

200-3 color	.24½	.25
150-3 color	.22½	.23

PARAFFIN WAX

NEW YORK (prices per pound)—

123-126 a.m.p.		.0375
125-127 a.m.p.		.0387
128-130 a.m.p.		.0412
133-135 a.m.p.		.0437
135-137 a.m.p.		.0455
Crude Scale:		
124-126 w.s.	.0205	.0215
124-126 y.s.	.0200	.0210

CRUDE OIL PRICES

Oklahoma, Kansas, North Central and East Central Texas

(Effective January 28, 1937)

East Texas (May 22, 1937)*	$1.35
Van, Tex.†	1.10
Camp Hill, Tex.	1.27
Cass County, Tex.‡	1.25
Talco	.73
Altus and Tipton, Okla.§	1.20
Other fields (see gravity table).	

*All companies. †Humble Oil & Refining Co.; Pure Oil Co. ‡Texas Co. §Gulf Oil Co. Talco by Humble Oil & Refining Co.

West Texas

See gravity table.

Pecos County*	$ .91
Pecos shallow†	.81

*Shell Petroleum Corp., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Petroleum Corp.

Rocky Mountain States

(Effective January 28, 1937)

Iles, Colo., light*	$1.18
Iles, Colo., heavy*	1.12
Greybull, Wyo.*	1.30
Torchlight, Wyo.*	1.30
Grass Creek, Wyo., light*†	1.30
Grass Creek, Wyo., heavy (Nov. 4, 1936)*†	.62
Hamilton Dome, Wyo. (Jan. 1, 1937)*	.67
Elk Basin, Wyo., light*†	1.30
Frannie, Wyo., heavy*	.62
Frannie, Wyo., light	.70
Hogback, N. M. (Jan. 28, 1937)*	1.33
Salt Creek, Dutton Creek and Midway, Wyo., take Stanolind's Oklahoma prices on a gravity basis.	
Big Muddy, Wyo.†‡	1.23
Rock Creek, Wyo.†	1.20½
Lea County, N. M. (see West Texas gravity table).	
Artesia, N. M. (Jan. 28, 1937)‡	.90
Maljamar, N. M. (Jan. 28, 1937)‡	.90
Canon City and Florence, Colo.	1.10
Lance Creek, Wyo.	.97
Lander, Wyo. (Jan. 1, 1938)†	.51¼
Sunburst, Mont. (Nov. 16, 1937)†	.90
Cat Creek, Mont. (Jan. 1, 1938)‡	$1.30
Garland, Wyo. (Jan. 1, 1937)†	.50

*Stanolind Oil & Gas Co. †Ohio Oil Co. ‡Continental Oil Co. ¶Hudson Oil Co.

Southwest Texas

(Effective January 28, 1937)

Pettus	$1.37
Salt Flat, Darst Creek, Hilbig, Carroll, Clark, Zoboroski	1.09
Lytton Springs	1.12
Luling	1.00

Saxet and Taft take same gravity table as Gulf Coast.

North Louisiana and Arkansas

Smackover, all grades	$ .90
Tullos and Urania	1.02
El Dorado East field	.90
Union County, Ark.	.90
Ouachita County, Ark.	.90
Lisbon, La. (Dec. 13, 1937)*	.98

*Caddo Crude Oil Purchasing Co.

Gulf Coast

(Effective January 28, 1937)

Choctaw and Darrow, La. See note below	
Clay Creek, Tex.	$1.00
Garden Island, La.	1.37
Cleveland, Tex.	1.27
Hardin, Tex.	1.15
Lafitte, La.	1.24
Livingston, Tex.	1.27
Welsh, La.	.98
Tepetate (La.) (Jan. 28, 1937)	1.24

Duval, Jim Hogg, Webb and Zapata counties, Texas, and Heyser and Placedo fields take Mirando gravity prices. Jennings, La., 5 cents lower than Gulf Coast prices on each degree. Segno, Texas, takes Gulf Refining Co.'s Gulf Coast prices. Choctaw and Darrow, Louisiana, posted for first time by Standard Oil Co. of Louisiana, start below 21 degrees at 90 cents, with 3-cent differential up to 25 gravity, then 2-cent differential up to 40 and above, $1.36. Effective October 1, 1937, Stanolind Oil & Gas Co. in Evangeline, La., pays 92 cents for below 20 gravity, adding 2 cents for each degree upward to 40 and over, at $1.34.

Middle Western States

OHIO OIL CO.
(Effective January 28, 1937)

Lima	$1.00
Illinois	1.35
Princeton, Ind.	1.35
Midland, Mich. (Jan. 5, 1938)*	1.12
West Branch, Mich. (Dec. 29, 1937)†	.80
Buckeye (Jan. 8, 1938)	1.09½
Arenac, Mich. (Dec. 29, 1937)†	.80
Muskegon, Mich.	1.00
Eastern Kentucky:	
Big Sandy River	1.42
Kentucky River	1.50
Western Kentucky	1.40

*Posted by Pure Oil Co.
†McClanahan P. L. and Simrall.
Midland, Mich., price posted by Simrall Corp. and Pure Oil Co. includes Greendale, Porter, Beaverton, Crystal and equal grades. West Branch and Arenac by Simrall Corp. Eastern Kentucky crude purchased by Ashland Refining Co., Ashland, Ky. Buckeye posted by Simrall Corp. and Pure Oil Co.

Eastern States

TIDE WATER ASSOCIATED OIL CO.
(Effective March 7, 1938)

Bradford, Pa.	$2.05
Allegany, N. Y.	2.05

SOUTH PENN OIL CO.
(Effective March 7, 1938)

Pennsylvania Grade Oil in National Transit Lines (Bradford field)	2.05
Pennsylvania Grade Oil in Southwest Pennsylvania Lines	1.71
Pennsylvania Grade Oil in Eureka Pipe Line lines	1.65
Pennsylvania Grade Oil in Buckeye Pipe Line lines	1.55
Corning Grade Oil in Buckeye Pipe Line Co.'s lines	1.27

PENNZOIL CO.
(Effective March 7, 1938)

Pennsylvania Grade Oil in National Transit Lines:	
Group A	1.98
Includes Cochran, Franklin, Hamilton and Doolittle districts.	
Group B	1.97
Includes Tidioute district.	
Group C	1.96
Includes Turkey and Tidioute districts.	
Group D	1.95
Includes Bear Creek and Porkey districts.	
Group E	1.93
Includes Eldeneau, Bull Creek, Rough Run, Carbon, Dipner, Bredlin, McJunkin, Jameson, Kenerdell, Emlenton, Tiona, Lacey and Kinzua districts.	

PURE OIL CO.
(Effective March 7, 1938)

Cabin Creek, W. Va.	$1.65
Bradford Hollow, W. Va.	1.65
Kelly Creek, W. Va.	1.65

Canada

Ontario (Sept. 9, 1933)*

Petrolia	$2.10
Oil Springs	2.17
TURNER VALLEY NAPHTHAS AND CRUDE OIL	
(January 5, 1938, by Imperial Oil, Ltd.)	
Clear naphtha and discolored naphtha, 65 gravity and higher	$2.14
Discolored naphtha and crude oil, 40-40.9 gravity	1.14
Increasing 2 cents for each degree gravity with top price for 64-64.9 gravity	1.62
These prices f.o.b. producers field tankage.	

*Imperial Oil, Ltd.

Mexico

Heavy Mexican crude	$.85

*In U. S. currency, f.o.b. ship, based on February spot market transactions.

Crude Prices by Gravities

	1 Oklahoma-Kansas	2 Oklahoma-Kansas	3 North and Central Texas	4 East Central Texas (Mexia district)	5 North Louisiana-Arkansas	6 Gray County, Texas	7 Hutchinson-Carson counties, Texas	8 Rodessa, Louisiana-Texas and Panola County, Texas	9 Conroe, Tomball, Raccoon Bend, (Deep) Satsuma	10 Gulf Coast	11 Gulf Coast	12 Lea County, N. Mex. West Texas except Pecos County	13 Mirando district, Texas	14 Marion County, Texas	15 Refugio, Greta, Saxet, Taft, Texas	16 Anahuac, Flour Bluff, Dickson, Turtle Bay	17 White Castle, Louisiana	18 Iowa, Louisiana	19 Cayuga, Texas
Bel. 18	....	....	....	....	....	....	....	....	....	$.90	....	....	....	....	....	....	....	$.90	....
18-18.9	....	....	....	....	....	....	....	....	....	.92	....	....	....	....	....	....	....	.92	....
19-19.9	....	....	....	....	....	....	....	....	....	.94	....	....	....	....	....	....	$.94	.94	....
20-20.9	....	....	....	....	....	....	....	....	....	.96	$.95	....	$.96	....	$1.01	....	.96	.96	....
21-21.9	....	....	....	....	....	....	....	....	....	.98	.98	....	.98	....	1.03	....	.98	.98	....
22-22.9	....	....	....	....	....	....	....	....	....	1.01	1.01	....	1.00	....	1.05	....	1.01	1.01	....
23-23.9	....	....	....	....	....	....	....	....	....	1.04	1.04	....	1.02	....	1.07	....	1.04	1.04	....
24-24.9	....	....	....	....	....	....	....	....	....	1.07	1.07	....	1.04	....	1.09	....	1.07	1.07	....
Bel. 25	....	$.98	....	....	$.90	....	....	$.93	....	....	....	....	....	$.90	....	....	....	....	$.88
25-25.9	....	1.00	....	....	.92	....	....	.95	....	1.10	1.10	$.78	1.06	.92	1.11	....	1.10	1.10	.90
26-26.9	....	1.02	....	....	.94	....	....	.97	....	1.13	1.13	.80	1.08	.94	1.13	....	1.13	1.13	.92
27-27.9	....	1.04	....	....	.96	....	....	.99	....	1.15	1.15	.82	1.10	.96	1.15	....	1.15	1.15	.94
28-28.9	....	1.06	....	....	.98	....	....	1.01	....	1.17	1.17	.84	1.12	.98	1.17	....	1.17	1.17	.96
Bel. 29	$1.06	....	$.96	$1.03	....	....	....	....	$1.20	....	....	....	....	....	....	....	....	....	....
29-29.9	1.08	1.08	.98	1.05	1.00	....	....	1.03	1.22	1.19	1.19	.86	1.14	1.00	1.19	....	1.19	1.19	.98
30-30.9	1.10	1.10	1.00	1.07	1.02	....	....	1.05	1.24	1.21	1.21	.88	1.16	1.02	1.21	$1.16	1.21	1.21	1.00
31-31.9	1.12	1.12	1.02	1.09	1.04	....	....	1.07	1.26	1.23	1.23	.90	1.18	1.04	1.23	1.18	1.23	1.23	1.02
32-32.9	1.14	1.14	1.04	1.11	1.06	....	....	1.09	1.28	1.25	1.25	.92	1.20	1.06	1.25	1.20	1.25	1.25	1.04
33-33.9	1.16	1.16	1.06	1.13	1.08	....	....	1.11	1.30	1.27	1.27	.94	1.22	1.08	1.27	1.22	1.27	1.27	1.06
34-34.9	1.18	1.18	1.08	1.15	1.10	....	....	1.13	1.32	1.29	1.29	.96	1.24	1.10	1.29	1.24	1.29	1.29	1.08
Bel. 35	....	....	....	....	$.96	$.91	....	....	....	....	....	....	....	....	....	....	....	....	....
35-35.9	1.20	1.20	1.10	1.17	1.12	.98	.93	1.15	1.34	....	1.31	.98	1.26	1.12	1.31	1.26	1.29	1.29	....
36-36.9	1.22	1.22	1.12	1.19	1.14	1.00	.95	1.17	1.36	....	1.33	1.00	1.28	1.14	1.33	1.28	1.29	1.29	....
37-37.9	1.24	1.24	1.14	1.21	1.16	1.02	.97	1.19	1.38	....	1.35	1.02	1.30	1.16	1.35	1.30	1.29	1.29	....
38-38.9	1.26	1.26	1.16	1.23	1.18	1.04	.99	1.21	1.40	....	1.37	1.04	1.32	1.18	1.37	1.32	1.29	1.29	....
39-39.9	1.28	1.28	1.18	1.25	1.20	1.06	1.01	1.23	1.42	....	1.39	1.06	1.34	1.20	1.39	1.34	1.29	1.29	....
40,over	1.30	1.30	1.20	1.27	1.22	1.08	1.03	1.25	1.44	....	1.41	1.08	1.36	1.22	1.41	1.36	1.29	1.29	....

Column 1—Companies posting are Barnsdall, Bell, Champlin, Continental, Cushing, Derby, Bay, Eason, El Dorado, Cities Service, Falcon, Globe, Gulf, Johnson, Kanotex, National, Phillips, White Eagle, Stanolind, Sunray, Texas, Sun Vickers and Wilcox.
Column 2—Anderson & Prichard, Carter, Cosco, Deep Rock, Magnolia, Mid-Continent, Pure, Rock Island, Shell, Sinclair, Skelly and Tide Water.
Column 3—All purchasers.
Column 4—Humble Oil & Refining Co. and Sinclair Oil Purchasing Co.
Columns 5, 6, 7 and 8—All purchasers.
Column 9—Humble Oil & Refining Co. and Sun Oil Co. Tidewater Oil Co.'s schedule starts at 35 degrees, $1.34 with 2-cent spread up to 40 and over at $1.44. (Raccoon Bend prices are for deep sand oil.)
Column 10—The Texas Co. (Gulf Refining Co. pays same prices up to and including 34 gravity, but continues its 2-cent spread up to 40 and over at $1.41.)
Column 11—Humble Oil & Refining Co., Sinclair Prairie Oil Marketing Co., Sun Oil Co.
Column 12—All purchasers.
Column 13—All purchasers (effective July 6, 1937).
Column 14—Magnolia Petroleum Co.
Column 15—Humble Oil & Refining Co. (effective July 6, 1937).
Column 16—Humble Oil & Refining Co.
Columns 17 and 18—Shell Petroleum Corp.
Column 19—Tide Water Oil Co.

Texas Wildcats

(Continued from Page 147)

Palo Pinto County

W. H. Clement No.*1 Federal Life Ins. Co., 2 mi. W Mineral Wells, sec. 51, T.&P. Sur., Blk. A (E of B). Drlg. 1,650 ft.
Bill Cole et al No. 1 J. W. Harris Est., NW cor. county, De La Garza Sur. S.D. 950 ft.

Shackelford County

Danciger No. 2 J. E. McCown, 330 ft. from S and E sec. 158, B.B.B.&C. Sur., N offset to Haterius. Drlg. 2,735 ft.
Joe DeGrazier No. 1 Harbough, E cen. part of county, sec. 1,563. T.E.&L. Sur. 4,500-ft. test; drlg. 1,300 ft.
Forest Dev. Corp. No. 1 T. G. Hendrick, NW cor. of county, 2,600 ft. from N line and 4,300 ft. from W line of sec. 1, A.B.&M. Sur. Est. 15,000,000 ft. gas per day 1,603-17 ft.; gas 1,662-65 ft., incr. est. 4,000,000 ft., 1,680-85 ft.; est. 1,000,000 ft. 1,804-06 ft. and 1,810-15 ft.; S.S. oil and wtr. 1,864 ft.; inc. wtr. 1,880-82 ft.; drlg. in sand.
Hugh King, Jr., et al No. 2 Davis-Walker, sec. 55-13, T.&P. Sur. S.S.O. 3,427-32 ft.; abd.; 3,965 ft., T.D.
R. C. Parker No. 1 J. Smalley, NW cor. of NE¼ county, 1,245 ft. from N line and 1,260 ft. from E line of sec. 11, E.T.R.R. Sur. Spd.
Ungren & Frazier No. 1 J. S. McKeever, 306 ft. from W line, 354 ft. from N line, NW¼ SW ¼ sec. 14-3, H.&T.C. Sur. 3,500-ft. test; spdg.

Stephens County

Danciger Oil Ref. Co. No. 1 Mrs. Aileen Copeland, 8 mi. SE Ivan, 1,196 ft. from E line and 350 ft. from S line of sec. 1, M.E.P.&P. Sur. Drlg. 3,542 ft.
Graham, Hafner, Lane & Inman No. 1 J. N. Yocum, 5 mi. SE of Frankell, 250 ft. from N and E lines of farm or approx. 2,525 ft. from E line and 1,400 ft. from S line of John R. Carter Sur. Trt. 1,000 gal acid 3,575-90 ft.; est. 25-50 bbls. per day; drlg. 3,434 ft.
I. C. Little No. 1 R. M. Rogers, NE¼ of county, 150 ft. from E line and 1,980 ft. from S line of sec. 28, T.&P. Sur., Blk. 5. Tstg. after 10,000-gal. acid 3,960-4,055 ft., T.D.; with 3,000,000 ft. gas.

Stonewall County

Bert Fields No. 1 R. P. Pierson, C of E 80-ac., E. A. & S. M. Lee Sur. Abst. 817. Loc.
General Crude Oil Co. No. 1 J. D. Smith, SW cor. county, 330 ft. from S and E lines of sec. 371. H.&T.C. Sur., Blk. 2. Set 13⅜-in. 2,119 ft.; drlg. past 2,600 ft.
F. B. Parriott No. 1 H. T. Carlile, 330 ft. from S line, 990 ft. from E line, SW¼ NE¼ sec. 283, Blk. D, H.&T.C. Sur., rotary to 5,500 ft., 6 mi. NW of Swenson. Drlg. 3,158 ft.

Taylor County

Dr. W. C. Braham et al No. 1 Ernest Armstrong, 3½ mi. E of Abilene, 220 ft. from S line and 330 ft. from W line of NE¼ SE¼ sec. 40, B.A.L. Sur. Drlg. 2,100 ft.
E. P. Campbell et al No. 1 McGee & Manley, 330 ft. from N, 750 ft. from E lines, SW¼ sec. 22-16, T.&P. Sur. S.D. at 2,060 ft. for 6-in.
Bert Fields et al No. 1 Sears, sec. 223, Blk. 64, H.&T.C. Sur. Drlg. 2,340 ft.

Throckmorton County

Humble O. & R. Co. No. 1-A Reynolds Cattle Co., 330 ft. from S and E lines, sec. 7-2, A.B.&M. Sur. H.F.W. 2,525-30 ft.; drlg. 2,102 ft. in lime.
Morris & Spoonts No. 1 Alden Bros., NW cor. county, 1,350 ft. from E line and 5,210 ft. from S line of Raymond Sanches Sur. A-248. Drlg. 810 ft.
Henry Zweifel No. 1 J. H. Lee, 4 mi. NE of Woodson, 930 ft. from E line and 2,011 ft. from S line of J. A. George Sur. T.D. 865 ft.; S.D.

Wise County

Latex Oil Co. No. 1 Smith, 3 mi. E of Bridgeport, Jas. Couch Sur. T.D. 4,075 ft.; P.B. to 3,910 ft.; S.D.; W.O.

Market Record of Active Oil Stocks

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1938 High	1938 Low	Week ending Mar. 12 Sales	High	Low	Close	Stocks—	Total shares outsanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1937	1937 High	1937 Low	1936 High	1936 Low
72½	57	1,000	66	63½	64⅞	Amerada Corp.	788,675	N.P.	50cQ	3-31-38	$2.00	114⅞	51½	125½	75
24	20	8,600	23	22	22½	Atlantic Refining	2,663,999	$25	25cQ	3-15-38	1.00	37	18	35⅛	26⅝
19	14⅛	3,000	17	16	16¼	Barber Co.	387,149	$10	75c	12-16-37	1.00	43⅜	10⅛	38½	21
16⅜	13	9,000	15½	14⅜	14½	Barnsdall Oil Co.	2,250,344	$5	25cQ	2-1-38	1.00	35¼	10	28¼	14⅛
10½	8½	14,300	9¼	8¾	8⅞	Consolidated Oil Corp.	13,919,417	N.P.	20cQ	2-15-38	.90	17⅞	7	17¼	11½
34⅜	27⅜	13,200	30	27⅜	28¼	Continental Oil of Delaware	4,682,615	$5	25cQ	3-31-38	1.50	49	24	44⅞	28⅛
8⅞	6¼	10,200	7⅜	7⅛	7⅛	Houston Oil (new)	1,098,618	$25	....	10-17-30	....	17⅝	4¾	13⅞	6⅜
22⅝	17⅛	3,100	18½	17¼	17¼	Mid-Continent Petroleum	1,855,912	$10	$1	11-1-37	1.50	35⅜	14	30⅞	17¼
17¾	14	400	14¼	14¼	14⅛	Mission Corporation	1,399,345	N.P.	25c	12-24-37	1.25	34	15	29⅞	16⅝
23	14¼	14,100	21⅜	19	20¼	National Supply	382,591	$25	$2 pf.‡	12-22-37	(‡)	41⅜	17⅝	75½	19⅞
14⅞	11⅞	6,800	13⅛	12¼	12¼	Ohio Oil Co.	6,563,377	N.P.	50cSA	12-15-37	1.00	22⅞	9	18	12⅛
15⅞	11¾	500	12	11⅝	11⅝	Pacific Western Oil	1,000,000	N.P.	75c	12-15-37	.75	29¾	11¾	23½	11¾
9	8	No sales	..	..	..	Pan American Pet. & Trans.	4,702,945	$5	$1 *	12-21-37	1.00	17⅛	7	20⅝	12¼
42½	34⅛	6,800	38	35½	36	Phillips Petroleum	4,449,052	N.P.	50cQ	3-1-38	2.75	64	30⅛	52⅜	38⅛
20	16¼	2,700	19½	18¾	19	Plymouth Oil Co.	1,050,000	$5	35cQ	9-30-37	1.65	29⅞	13	27¾	11⅞
13½	10¼	34,900	12⅛	11	11¼	Pure Oil Co.	3,281,120	N.P.	25c	12-1-37	.25	24⅜	8¾	27⅞	16
7⅞	5⅝	6,200	6⅜	5⅞	5⅞	Richfield Oil Corp.	3,986,638	N.P.	25c	12-24-37	.25	6½	4⅛	..	..
27½	20	3,600	24¼	22½	22⅝	Seaboard Oil of Delaware	1,224,283	N.P.	25cQ	3-15-38	1.00	54⅛	16	44	30½
18¼	13⅞	5,300	15¼	13	13⅜	Shell Union Oil	13,070,625	N.P.	50c	12-20-37	1.00	34¾	14⅞	28¼	14¾
34¾	24⅛	500	27½	25	25	Skelly Oil	1,006,348	$15	50c	12-15-37	1.50	60⅝	26½	47⅝	19½
16⅝	13¾	26,600	14⅝	13⅞	14	Socony-Vacuum	31,151,071	$15	25c	3-15-38	.80	23¼	13	17½	12½
33⅞	28⅝	10,500	32	30	30⅛	Standard Oil of California	13,014,754	N.P.	35cQ†	3-15-38	2.00	50	27⅛	47⅝	35
35½	30½	9,400	32½	30⅜	30⅜	Standard Oil (Indiana)	15,196,241	$25	25cQ	3-15-38	2.30	50	26½	48½	32¾
35½	34	100	34½	34½	34½	Standard Oil of Kansas	112,837	$10	$5	12-20-37	5.00	43	30⅝	31	25
54⅛	44½	21,000	50½	47⅞	49	Standard Oil of New Jersey	25,856,081	$25	$1.25SA†	12-15-37	2.50	76	42	70⅜	51⅛
57⅞	48½	400	52	50¾	52	Sun Oil	2,316,486	N.P.	25cQ	3-15-38	$1 & 8% Stk.	77½	44½	91	70
3⅜	2½	3,600	2⅜	2½	2½	Superior Oil Corp.	1,388,079	$1	....	....	....	7¾	1½	6¾	3
44⅞	37¼	22,900	41½	38½	39⅜	Texas Corp.	10,896,858	$25	50cQ	4-1-38	2.25	65⅛	34¾	55¼	28⅞
4⅞	3⅝	3,800	4	3⅝	3⅝	Texas Gulf Producing Co.	888,134	N.P.	10c	12-23-37	.10	9⅝	2	8⅞	4⅜
10⅛	7⅜	8,900	9¼	8⅛	8½	Texas Pacific Coal & Oil	888,237	$10	10c	3-1-38	.40	16⅝	5⅜	15¼	7½
15½	13⅛	5,300	14⅜	13⅜	13½	Tide Water Associated	6,288,512	N.P.	25cQ	3-1-38	1.20	21⅝	13⅛	21¾	14¾
21⅝	18½	2,300	20⅞	20	20	Union Oil of California	4,666,270	$25	30cQ	2-10-38	1.40	28¼	17½	28½	20¾
23½	21⅞	400	22¾	22	22	Union Tank Car Co.	1,200,000	N.P.	40cQ	3-1-38	1.60	31½	22	31⅝	22⅝
2¾	2¼	2,100	2⅝	2½	2½	Wilcox Oil & Gas	424,839	$5	....	5-10-28	....	6¼	1¾	5¼	2¾

*Payable in 3½% notes. †Includes extras. ‡One-tenth share $2 preferred stock.

New York Curb Exchange

1938 High	1938 Low	Week ending Mar. 12 Sales	High	Low	Close	Stocks—	Total shares outsanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1937	1937 High	1937 Low	1936 High	1936 Low
9⅜	5½	13,100	7⅞	5½	6¼	American Republics Corp.	1,308,049	$10	30c	12-27-37	$0.40	10	6⅝	..	..
10¼	8¼	700	9	8⅜	8⅜	Bridgeport Machine Co.	260,000	N.P.	1.25	12-30-37	$2.00	21⅜	7	21	13¼
39	35	150	37¾	37¼	37¾	Buckeye Pipe Line Co.	200,000	$50	75cQ	3-15-38	3.75	51½	36	50	39¾
110	100	100	110	110	110	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	3-21-38	7.00	123	95½	124¾	105
2	1½	14,200	1¾	1½	1½	Cities Service	37,804,394	N.P.	....	6-1-32	....	5⅜	1½	7⅜	3
2⅜	1½	1,300	1¾	1⅝	1⅝	Cosden Petroleum	399,687	$1	....	..	....	5½	1½	4½	1½
27½	22½	4,700	24¾	22½	22½	Creole Petroleum	6,974,356	$5	50cSA†	12-15-37	1.00	38¾	20¼	39	19⅞
8¾	7	No sales	..	..	..	Darby Petroleum	351,390	$5	25cSA	1-15-38	.50	18⅝	6½	18⅛	9
3½	2½	1,800	2¾	2½	2½	Derby Oil & Refining	263,162	N.P.	....	.....	....	8⅜	2¼	6¾	1⅞
31	31	No sales	..	..	..	Eureka Pipe Line	50,000	$50	$1Q	2-1-38	4.00	47½	24½	47½	38½
42⅞	37	8,300	40	37	37¾	Gulf Oil Corp.	9,076,202	$25	25cQ	4-1-38	1.00	63½	33	59	36
70	60	4,100	68	66	66¾	Humble Oil & Refining	8,923,935	N.P.	37½c	4-1-38	2.00	87	54⅞	80	57
19½	17⅞	1,900	19⅛	18½	18½	Imperial Oil of Canada	26,919,871	N.P.	62½cSA†‡	12-1-37	1.25	24¼	14½	24½	19¾
8¼	6⅝	400	8	7¾	7¾	Indiana Pipe Line	300,000	$10	50cSA	11-15-37	.80	15	5⅞	9¾	5½
31¼	28½	4,400	31⅜	30⅞	31	International Petroleum	14,247,088	N.P.	$1.25†‡	12-1-37	2.50	39½	23½	39⅝	32⅝
5	3¼	1,100	4⅜	4⅛	4⅛	Kirby Petroleum Co.	500,000	$1	10c	9-15-37	....	8¾	2⅜	5¾	2⅝
25⅛	18¾	2,200	22½	21	21⅛	Lion Oil Refining	270,000	N.P.	50cQ†	12-24-37	1.50	34	12½	17¾	7⅜
9¼	7⅛	800	8	7¾	8	Lone Star Gas	5,382,723	N.P.	20c	4-20-38	.60	14¼	5¼	14¼	9⅞
9⅜	8	2,900	8⅞	8	8	Louisiana Land & Exp.	3,000,000	N.P.	20cQ†	12-15-37	.50	15¼	6¾	15⅜	9⅞
8⅛	7	1,000	8⅛	7½	8¼	Midwest Oil Co.	998,444	$10	50c	12-15-37	1.00	14⅝	6¼	..	..
5¼	4⅝	2,200	5¼	5	5⅛	Mountain Producers	1,682,182	$10	30cSA	12-15-37	.60	7⅞	4⅛	8⅜	5
14⅝	13	1,400	14½	13⅞	13⅞	National Fuel Gas	3,810,183	N.P.	25cQ	1-15-38	1.00	19½	12	23	17⅜
9¼	7¾	600	8⅝	8½	8½	National Transit	509,000	$12.50	55cSA	12-15-37	1.00	12½	7¼	15¾	9¼
2⅝	1¾	300	2	1⅞	2	New Mexico and Arizona	1,000,000	$1	1c	12-1-36	....	5	1⅛	6⅝	1⅝
4½	4	No sales	..	..	..	New York Transit	100,000	$5	15c	4-15-38	1.00	5⅜	3⅞	6¼	4¼
6	5½	100	6	6	6	Northern Pipe Line	120,000	$10	25cSA	12-1-37	1.00	12¾	5¾	9¾	4⅞
7⅜	5⅜	33,200	6⅞	6¼	6¼	Pantepec Oil	1,608,700	N.P.	....	.....	...	9⅝	2¾	10⅛	3¼
3½	2¾	500	3	2¾	2¾	Root Petroleum Co.	336,045	$1	25c	2-1-37	.25	13¾	2	19¼	4½
4	3⅛	No sales	..	..	..	Ryan Consolidated	296,931	N.P.	....	.....	....	6½	2¼	4¾	1⅞
5⅜	4¼	100	4¼	4¼	4¼	Southern Pipe Line	100,000	$10	15cSA	3-1-38	.45	7¼	3⅞	7⅞	3¼
39	36	2,100	39	36	36½	South Penn Oil	1,000,000	$25	50cQ†	3-31-38	3.65	56	35	44	32½
22	22	No sales	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50cQ	12-31-37	2.00	42	20	60	44
18	16⅞	1,500	17¼	16⅞	16⅞	Standard Oil of Kentucky	2,604,790	$10	25c	3-15-38	1.50	21⅛	14¾	23⅜	17⅛
7½	6½	400	7⅜	6¾	7⅜	Standard Oil of Nebraska	188,403	$25	25c	3-29-37	.25	13¾	8	14⅝	11
22	19	300	19¾	19½	19½	Standard Oil of Ohio	753,740	$25	25c	3-15-38	1.50	45	16	40	21¾
3¼	2⅞	3,300	3	2⅞	2⅞	Sunray Oil	1,910,119	$1	10c	12-24-37	.25	4⅞	2	5	2⅝
4⅜	4	200	4¼	4¼	4¼	Texon Oil & Land	336,028	$2	15cQ	3-31-38	.45	7⅝	2	9¾	5⅜
7⅝	5½	1,600	6⅝	5¾	5¾	Transwestern Oil Co.	750,000	$10	....	.....	....	13⅞	4⅝	..	..
5¼	3½	10,200	4	3⅝	3⅞	United Gas Corp.	7,818,959	$1	10c	9-15-37	....	13⅝	3	10¾	4

†Includes extras. ‡Payable in Canadian funds. §Of which $1 was in preferred stock.

New or Improved Equipment

Stainless Bubble-Caps Formed in Several Types of Alloy

The accompanying illustration is that of a refractionating-tower bubble-cap made from Allegheny No. 66 (17 per cent chrome) stainless alloy. Being in the shape of a cube with a concave top to present a streamline target for the gases, it is significant that this high chrome alloy is being commercially pressed into a one-piece seamless design. The progress made in the production of these high chrome alloys, and the ingenuity of the modern press-shop combined to make this difficult drawn shape a success in this type of alloy. Numerous sizes of round, hexagon, triangular, and oblong stainless bubble-caps can be produced in a range of alloys as well as plain carbon steel.

The producer of these caps, Fritz W. Glitsch & Sons, 2423 Caroline Street, Dallas, Tex., says its engineering facilities enable the company to offer constructive suggestions for the redesigning of bubble-caps in Allegheny metal (18-8), Allegheny No. 33 (13½ per cent chrome), Allegheny No. 66 (17 per cent chrome), and Allegheny No. 46 (5 per cent chrome), in pressed as well as in the combination of pressed and fabricated types.

Formed caps like those here illustrated were installed in fractionating towers for a large natural gasoline manufacturer by Wyatt Metal & Boiler Works, of Dallas and Houston, Tex.

Bulletins, Booklets and Other Literature for the Trade

A 28-page bulletin ready for distribution by the Watson-Stillman Co., Roselle, N. J., describes and illustrates forged steel fittings for high-pressure, high-temperature oil, gas, steam, ammonia, and hydraulic service.

How the International truck offers safety in the transportation of nitroglycerin for shooting wells is told in an article in the current number of the International Trail, published by the International Harvester Organization, 180 North Michigan Avenue, Chicago.

Hays Corp., Michigan City, Ind., offers a 40-page brochure on centralized combustion control for steam power plants. An eight-page supplement covers designing and manufacturing of boiler-room panels. The two publications afford an exposition of modern combustion control methods.

The Michiana Products Corp., Michigan City, Ind., announces a four-page pamphlet describing and illustrating the Michiana sand-blast gun. Photographs show various operations.

Worthington Pump & Machinery Corp., Harrison, N. J., is sending on request an eight-page bulletin, S-550-B4C, describing its vertical, four-cycle, type AG gas engines. It includes complete specifications together with typical installation views.

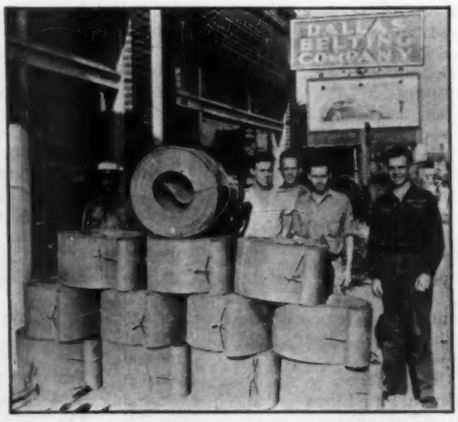
For refineries, chemical plants, and plants where corrosive or explosive gases may be present, the new pamphlet, "Five-Point Protection Against Explosion and Corrosion with Westinghouse De-Ion Oil Immersed Motor Starters," will be of interest. Copies may be obtained from the nearest district office of the Westinghouse Electric & Manufacturing Co. or from headquarters in East Pittsburgh, Pa.

The fifth edition of the Procedure Handbook of Arc Welding, Design and Practice has been issued by the Lincoln Electric Co., Cleveland, Ohio. This book covers arc welding in detail with numerous illustrations, graphs, and charts.

How one oil-field superintendent speeds up evaporation of salt water is told in the latest issue of Between Calls, published by Walter O'Bannon Co., Tulsa. With 7 wells producing 500 bbls. of oil and 3,500 bbls. of water daily, residue gas is released under the water in a pit and allowed to burn at the surface.

Quick Time on Belting Order

"Deliver us twelve 14-inch 7-ply endless Lynx belts 93½ feet long within the next 24 hours," was the order received recently from a large oil company by the Dallas Belting Co., distributor for the Diamond Mechanical Division of the B. F. Goodrich Co. But for the development of the Plylock Splice by Goodrich, which enables the distributor to make belts endless either on the pulleys or in his own shop, it would have taken two or three weeks to fill this order. In less than 24 hours all splicing operations had been completed and the belts stacked in front of the office ready for delivery.



Oil Men Listen to Discussion of General Electric Switchgear

Engineers and executives of major oil companies and public utilities were entertained recently at a dinner in the Hotel Tulsa, in Tulsa, given by officials of the Southwestern General Electric Co. The dinner preceded a display and discussion of switchgear. Switchgear is the term used by the company to cover all switches, circuit-breakers, insulators, fuse units, jacks, plugs, and other equipment used to control current.

H. M. Low, engineer, Phillips Petroleum Co., and W. S. Sease, engineer, Stanolind Oil & Gas Co., listening to G. M. Bostock, switchgear engineer of the General Electric Co.

The occasion was part of a national program for acquainting key men in various industries and power companies with recent changes resulting from research and development. A traveling exposition consisting of models and actual equipment costing $50,000 was used to demonstrate the points made in the lecture given by G. M. Bostock, switchgear engineer. He outlined what General Electric is doing to reduce the costs of transmission and maintenance.

In addition to the oil-blast circuit-breakers, the exhibit included outdoor switches and fuses, air circuit-breakers, relays, streamlined switchboards, cubicles, and metal-clad switchgear.

A. L. Jones, Tulsa manager, introduced the lecturer, who was assisted by R. F. Tinnerholm, manager of switchgear sales; S. R. Rieves and F. C. Barrett of the Philadelphia factory, and M. L. Larmer, district advertising manager, of Dallas, Tex.

For Cleaning Air-Filters

The new Circo air-filter cleaner announced by Circo Products Co., Cleveland, Oho, not only cleans an air-filter in a few minutes, but re-oils it at the same time when the Circo "Air Solv" is used. Kerosene or other cleaning solvents can be used, if desired. A feature is the settling-chamber at the bottom of the cleaner, which automatically separates dirt and grit from the solvent, to assure a constant supply of dirt-free solvent for each cleaning job. The cleaner operates from compressed air, is automatic, has no moving parts to get out of adjustment and is said to be fool proof. It is 38 inches high and 18 inches in diameter, stores a minimum of 5 gallons of cleaning solvent and can be easily rolled to any part of a service station.

Crane's Brass Globe and Angle Valves Have Plug-Type Disc

For severe service on small lines carrying steam, hot water, cold water, oil, gas and similar fluids, Crane Co., Chicago, is offering a line of brass globe and angle valves with plug-type disc of Crane nickel alloy and body seat ring made of Exelloy, a specially heat-treated chromium iron. This combination of metals is considered especially valuable for seating surfaces, having excellent resistance to wear, temperature, galling and scoring. It is harder, stronger, and tougher than metals ordinarily used in brass valves.

Made in sizes of one-eighth inch to 3 inches, these valves are recommended for 150 pounds steam working pressure and 300 pounds on cold water, oil or gas lines. Their wide seat bearing is unusually resistant to wire drawing and foreign matter, and their tapered disc permits easy flow regulation when throttling.

The stuffing-boxes are fitted with a gland and filled with high-grade packing and may be repacked while under pressure when wide open. The valves are similar to the Crane 14-P and 16-P brass valves and all parts are interchangeable.

Parsons Is Advanced by J. & L.

Lewis M. Parsons, newly elected vice president in charge of sales and a director of Jones & Laughlin Steel Corp., Pittsburgh, Pa., will have entire charge of all sales activities, including district sales offices in 23 cities in the United States and Canada and warehouses in 7 cities.

After leaving, in 1917, the University of Pennsylvania, where he was on the varsity crew and the freshman football and swimming teams, class of 1919, to join first the navy, later the Naval Flying Corps, young Parsons entered the employ of the Bethlehem Steel Corp. in the sales division. He was made assistant manager of sales, Philadelphia office, in 1932, and manager of sales at the same office in 1936.

Here and There With Men Who Manufacture Equipment

Theodore F. Fields, for five years representing E. D. Bullard Co. in its Houston, Tex., territory, has been promoted to district manager, his new territory including Texas, Oklahoma and Louisiana. E. B. Bain, industrial safety man, has been added to the Houston organization.

The Harnischfeger Corp., Milwaukee, Wis., has appointed the Lyons Machinery Co., Little Rock, Ark., as sales representative of P&H Hansen Smootharc welders and Smootharc welding electrodes.

Arthur F. Weston, formerly in charge of the Cincinnati office of the Morse Chain Co., Ithaca, N. Y., has been made manager of the Chicago office. William C. Gilbert, formerly of the Detroit office, has been transferred to Chicago. C. A. Shetter, formerly manager of the Cleveland office, becomes manager of the Cincinnati branch. Lon Sloan, formerly special development engineer in Chicago, becomes manager of the Cleveland office.

The Jarecki Manufacturing Co. has added Albert S. Wasson to its city sales force in Tulsa. Mr. Wasson was formerly field salesman for the Oil Well Supply Co. in Ada, Okla., and previous to that was store manager for the Atlas Supply Co. in Fittstown, Okla.

G. W. Somers, formerly with the South Texas Geophysical Corp., has opened the Somers Geophysical Co., Shell Building, Houston, Tex. He is licensed by the Standard Oil Developing Corp. to operate the "Eltran" geophysical method, developed by Dr. L. W. Blau of the Humble Oil & Refining Co.

Drilling Footage Increased by Sullivan Featherweight Rig

The Sullivan class UW-161 Featherweight drill rig, announced by the Sullivan Machinery Co., Claremont, N. H., has the following advantages, according to the manufacturer: Doubles the footage of a hand-held drill; uses less air than the two drills which it can replace; uses less gasoline; portable by one man; saves on labor charges as one man can do the work of two.

This new drill rig uses the Sullivan L-12 hand-held drill for the drilling machine, and the L-12 in turn is run by the new Sullivan J-5 automatic chain feed. With this automatic feed, the manufacturer says, the operator can obtain maximum drilling speed and efficiency from his machine day in and day out. Also, less time is spent in changing steels and in pulling stuck steels. More time is spent in the actual drilling operation, resulting in substantial lowering of costs.

Plate Sprockets Added to Stock

In addition to the regular stock of hub-type sprocket wheels, Link-Belt Co.'s Dallas, Tex., warehouse, 413-415 Second Avenue, now carries complete stocks of cut-tooth type A plate steel sprockets for chains ½-inch up to 2-inch pitch, inclusive. These are wheels that can be mounted on drum hubs and bored out to fit the size of the hub which the purchaser has available.

Takes Superheat From Steam to Be Used in Process Work

Northern Equipment Co., Erie, Pa., has introduced the new Copes desuperheater, designed for either total or part elimination of the superheat from steam to be used for process work, or for auxiliaries built for reduced-temperature steam. It operates on steam from 212 to 1,100° F., maintaining within close limits the desuperheated steam temperature, regardless of changes in temperature of the superheated steam.

The desuperheater is installed in the steam line as a self-contained unit. The only connections needed are a water supply for desuperheating, a water- or air-pressure line for the diaphragm operator, and a drain to carry off excess condensate brought over by the steam when the desuperheater is first cut into service.

The flow of cooling-water is controlled at the spray-nozzle. A constant pressure drop is maintained across the nozzle, permitting a continuous supply of cooling-water to be sprayed into the superheated steam in exact proportion to the demands, from minimum to maximum flows. This fact, with the positive action of the thermostatic temperature-control elements is said by the manufacturer to assure dependable operation and sensitive control under virtually all conditions.

Boiler feed-water can be used as a cooling-water supply. Air or water can be used to actuate the pilot operator of the water-control valve. The desuperheater can be designed to use the cooling-water for this purpose if desired.

Simple external adjustments permit varying the degree of desuperheat and the sensitivity of control at will. The unit is easily dismantled for cleaning by removing the lower cover of the mixing-chamber.

FRED E. COOPER'S FACILITIES INCREASED BY AIRPLANE

A five-place Stinson cabin plane for executive use has been bought by Fred E. Cooper, Tulsa, to enable the Cooper organization to give more rapid service as oil-field distributor of Allis-Chalmers well-servicing units and power engines. Two recent trips to the oil fields of South America, made entirely by air, convinced Mr. Cooper that a plane would help him to provide a more efficient service to his customers through the oil fields of the United States and Mexico. According to present plans, it is understood, Mr. Cooper will act as his own pilot.

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MAP of State of Texas, Eastern N. M., parts of Southern Okla., SW Ark. and La., shows Oil and Gas Fields in color, Counties, County Seats, elevations, coordinated alphabetical index of counties and fields Price $1.00 postpaid

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THE DOWSING METHOD for locating oil structures, faults, and treacherous areas, operates on the principal of vibratory response to emanations from petroliferous sub-strata. Our WATSON No. 2, pioneer well of the Wilmington, Calif., field was located by this method and all my personally owned production. 15 years experience. This physico method may solve all your structural difficulties. Geo. Miller, 1548 Post Ave., Torrance, Calif. Ph. 983.

Business Opportunities

SMALL refinery, only one in county, ideal location, six trucks serving 40 stations. Large warehouse, storage, at invoice. Account of health. S. L. West, Shawnee, Oklahoma.

Leases and Drilling Blocks

FOR SALE: 3-year commercial lease. south 125 acres, south half Section 198, Block 1 B.B.B. & C. Fisher County, Texas, $25.00 per acre. East 40 has test hole drilled in 1930. Will lease 40 acre tracts $30.00 per acre. Cooper and Hardaway, Owners. G. W. Hardaway, 2809 Wheeling, El Paso, Texas.

NEW MEXICO Oil Leases for sale, Wholesale. Inquiries invited. Write, Box 507, Las Vegas, New Mexico.

QUICK action wanted on McClosky well on seismograph structure in No. 1 location Illinois Basin for percentage of acreage. Address Box J-310, The Oil and Gas Journal, Tulsa, Oklahoma.

TELL ME your wants in drilling blocks, leases, production in North Louisiana. G. Lucas, 124 Milam Street, Shreveport, La.

TO DRILL or sell, acreage in Canton, Kansas oil field, major companies on two sides. Production guaranteed. A. H. Groneman, 518 West 6th, Newton, Kansas.

SECURITY ABSTRACT COMPANY
El Dorado, Arkansas
Fee, Lease & Mineral Ownership on short notice. Ownership maps.

Leases and Drilling Blocks

ATTENTION

Our method of selling oil property will interest you. Oil Property Advertising Sales Co., Box 2603, Tulsa, Oklahoma.

I OWN 3,000 acres free in N. Pittsburg & Atoka Cos., Okla. 40 to 1000 A. tracts, no trades. Cash sale, lease or royalty. $5 to $25 per A. Townsite on 2 RRs. near production. J. E. Cavanagh, Baker, Ore.

New Mexico OIL LEASES WHOLESALE
40 acres at a time.
Roy G. Barton, Clovis, New Mexico.

FOR
SOUTH GEORGIA
Oil Leases and Royalties
Write
C. W. DEMING, Registered Dealer
Hinson Building, Waycross, Georgia.

TURN YOUR DEAL with our list of selected operators. Not major companies. Write Oil Industry Mailing List Co., 909 Tulsa Loan Building, Tulsa, Oklahoma.

DRILLING deal wanted. Forty acres Clay City Pool Illinois. Have geology by well-known geologist. Production on four sides. Address Box J-302, The Oil and Gas Journal, Tulsa, Oklahoma.

ILLINOIS, INDIANA and TENNESSEE, drilling blocks, near drilling activity, or in semi-proven territory. Liberal offer for tests. Will sell some small scattered acreage, in Coles and Edgar Counties, Ills. Sam J. Burkitt, Noweaqua, Illinois.

FOR SALE—One-half interest in completed well on 600 acres, gas leases, surrounded by producing territory. Well located structurally, with assured year round gas market at 15 cents per thousand, priced at cost of drilling well and leases. Owned by conservative producer and contractor who will bear closest investigation. Located in Eastern territory. Address Box J-294, The Oil and Gas Journal, Tulsa, Oklahoma.

ILL. BASIN begins big spring development. Get in now. March may end opportunity. Choice leases for sale or development. Write, Hathaway, Albion, Illinois.

OIL leases for sale, close to production. Offset 160 acres, 730 ft. 320 acres offset to three wells. 160 acres close to deep test. On structure. Box 10, Kincaid, Kans.

LEASES and Royalties. Drilling Blocks. Illinois Basin. Write Elton Beck, Herrick, Illinois.

DRILLING DEAL WANTED
80 Acre Lease Montana. Production all four sides. Address Box J-299, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES, Royalties and drilling blocks throughout present hot play southern Arkansas. El Dorado Oil Exchange, Garrett Hotel Building, El Dorado, Arkansas.

1920 ACRES Alberta wildcat high gravity oil in water wells, geologist's report 2200 ft. test desired. C. T. Fillan, Registered Broker, 312 Lancaster Bldg., Calgary, Alberta.

FOR SALE: Selected oil leases, Illinois basin. 8 years to run. L. Livingston, 5057 Enright Ave., St. Louis, Missouri.

6500 ACRES New Mexico block, fully geologized, with well partially drilled, complete with equipment and casing. Must handle to settle estate. Also 3500 acre drilling block in Huerfano County, Colo. on Alamo Structure near test well now drilling. Also smaller leases on Alamo. C. H. Radford, Box 614, Pueblo, Colo.

5,000 ACRES leases Webster County, Kentucky, scattered among Carter, Gulf, Tide Water and other major company holdings. 10-year term, 25 cent delay rentals, all recorded. Prices reasonable. Deep test just started. No trades. Write, P. O. Box 19, Owensboro, Kentucky.

A "Complete" service on developments Texas Panhandle Field. Reasonable Monthly rates, one or all Counties. Dwight Well Log Service, Rule Bldg., Amarillo, Texas.

FOUR 80's in shallow area, semi-proven, on trend from 200 bbl. well at 982, 41 gravity. Will sell for $10.00 A., half cash, half oil. L. D. Wise, Geologist, 912 S. 2nd St., Lawton, Oklahoma.

For Sale—Equipment

For Sale—Equipment

USED EQUIPMENT

Offered subject to prior sale and subject to price change without notice.

4-INCH LINE PIPE

4-inch (4½" OD) long collar, very best grade, 8-thread, carefully sorted and graded Line Pipe ready for delivery from the following yards:

11,000-feet	Chase, Kansas.
15,000-feet	Wichita, Kans.
15,000-feet	Oklahoma City, Okla.
20,000-feet	Corpus Christi, Tex.
8,000-feet	Houston, Texas.
4,000-feet	Kermit, Texas.
10,000-feet	Odessa, Texas.
18,000-feet	Pampa, Texas.
4,000-feet	Talco, Texas.
6,000-feet	Wichita Falls, Tex.
4,000-feet	Rodessa, La.

Can also make immediate delivery from the above and other yards on any grade and practically any quantity needed of 2", 3" and 6" Line Pipe.

USED DRILL PIPE WITH TOOL JOINTS

Drill Pipe listed here can be used with safety and economy in any normal drilling work. Each string is good for any number of wells. Heavy depreciation has been taken by the original user bringing the price down to an attractive figure.

5,168-ft., 4½" OD, 16.60-lb. Range 2, with Regular Acme Thread Tool Joints. In stock at Corpus Christi.

3,500-ft., 4½" OD, 16.60-lb. Range 2, with Reed API Shrinkgrip, Full Hole Tool Joints. This is unusually good pipe and joints, having made only a few trips in the hole. In stock at Wichita Falls.

DRILLING BOILERS

In Corpus Christi, Tex. yards: (2) 125 h.p., 250-lb. WSP Lucey Camel Back Type Oilfield Boilers with handhole and manhole plates, good stacks, steam and water gauges, blow off valves, etc. These are exceptionally good boilers, priced to sell.

AIR COMPRESSOR

Completely rebuilt Ingersoll-Rand, Type No. ER-2, 6" x 3¼" x 6" Straight Line, Horizontal, heavy duty Compressor with Belt Pulley. Designed to deliver 300-lbs. discharge pressure at 350 RPM. Rebuilt by us. Guaranteed to be in absolutely "jam-up" operating condition.

Price: $250 f.o.b. Wichita, Kansas.

UNION TOOL ROTARY DRAW WORKS

6" Type 5C3 Union Tool fully unitized Draw Works. Has line shaft mounted directly behind the drum shaft with cathead on the stub shaft. Complete with American Automatic Cathead, good chains and chain guards. Unit has been thoroughly overhauled and is guaranteed in every respect.

Price: $2,750 f.o.b. Corpus Christi.

AUTOMATIC CATHEAD

Slightly used Hill & Foster Friction Break Out Automatic Cathead for 5⅞-inch shaft. (Can be bored to fit larger shaft.) This is in perfect condition—except for a few scratches appears to be new.

Price: $448.00 f.o.b. Wichita.

ELECTRIC ROTARY DRIVE

Hild Electric Differential Drive, powered with two 25/65 h.p. Westinghouse Motors. (Motors have new grids and new controls.) Motor sizes: (1) 150 h.p.; (1) 200 h.p. This entire unit has been completely overhauled from stem to stern, including motors, grids, differential, couplings, etc. A similar unit recently rebuilt and sold by us is giving excellent service. This equipment is located at Wichita. Offered at about 1/5th its original cost.

ROTARY ELEVATOR

6⅝" OD Byron-Jackson (Wilson type) Extra Heavy, Center Latch Rotary Elevator, bored out for external upset 6⅝" Drill Pipe. Good shape in every way.

Price: $120 f.o.b. Oklahoma City.

ALMOST NEW WAUKESHA ENGINE

Model 6-GAL, 5 x 5½ I.C.E.I. net h.p. rating 120 h.p. at 1400 RPM, 6-cylinder Waukesha Gas-Gasoline-Butane Engine with removable cylinder liners and all regular equipment furnished with a new engine of this type. Perfect mechanical condition. Was used only very short time. Very substantial discount off new price, Wichita stock. Can be moved anywhere and still be a bargain at the price.

COUNTERSHAFT CLUTCH

Used Type 2-SP, Size 3315 O.C.S. Universal Type Roller Bearing Countershaft Clutch. Two speeds forward and one reverse. Clutch to band wheel pulley: 22½" dia. x 15" wide; Reverse pulley: 34½" dia. x 10½" wide; high speed pulley: 41" dia. x 13" wide; low speed pulley: 45" dia. x 13" wide. Completely overhauled. Guaranteed.

Price: $350 f.o.b. Wichita.

ROTARY DRILLING ENGINES

Rebuilt, 12" x 12" Ideal semi-enclosed, plain Bearing, twin cylinder Drilling Engines mounted on steel skids. Mechanical condition fully guaranteed. Very attractive prices. One each in stock at Odessa and Corpus Christi.

POWER HOIST

Size SDR-85, used C.M.C. Power Driven Medium Duty, or 15 h.p. Reversible Hoist. Designed to lift 1700-lbs. with a single line with a speed up to 175-feet per minute. Has 22" flange drum with cathead. Can be used with multiple sheave blocks. Standard make, replacement parts readily available. Suitable for lease or commercial services.

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